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OF

AGRICULTURE, MANUFACTURES, MECHANIC ARTS, INTERNAL IMPROVEMENT, COMMERCE,

AND

GENERAL LITERATURE.

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M. TARVER AND T. F. RISK,
EDITORS AND PROPRIETORS.

PUBLISHED MONTHLY.

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March 1, 1848.

THE

WESTERN JOURNAL,

M. TARVER AND T. F. RISK,

EDITORS AND PROPRIETORS.

VOLUME I. MAY, 1848. NUMBER V.

TABLE OF CONTENTS.

ARTICLES.

I. SLAVERY IN THE UNITED STATES.—The Influence of Climate upon the Physical and Moral Condition of the Human Family; Disobedience to Natural Laws the Cause of Negro Slavery; The evil Effects to be apprehended from Agitating the Subject; The Advantage of Slavery in the United States to the Inhabitants of other Countries; The Separation of the Races by reason of the increase of Population; Change of Slavery from the Domestic to a Political Institution; The Advent of the Negro Race to this Country the result of Natural Laws, and necessary to the Improvement of their Condition, and to the Development of the Resources of the Continent; The future Destiny of the Negro Race; Their Return to Africa; Colonization Society; The Condition of the American Indian and African Compared; The Effects of Sectional Legislation, &c.

By the SENIOR EDITOR, 231

II. ELECTRIC LIGHT.—Exhibition by M. Acherean; Its Advantages over Gas and all other means yet discovered for Lighting Streets and Houses....By J. M. P., 242

III. GEOLOGY OF THE VALLEY OF THE MISSISSIPPI.—Reference to the New York System of Geological Formations, compared with those of the West; The Necessity of Studying the Formations of other States in the Valley of the Mississippi, in order to understand the Geology of Missouri; Extent and Resources of this Valley; Its Geological Features; Great Tertiary and Cretaceous Border on the South and West; Great Extent of the Carboniferous Group of Rocks; Exceptions to their General Prevalence in the whole scope of this Valley not occupied by the Tertiary and Cretaceous Groups; The three Divisions of the Carboniferous Rocks fully developed in Alabama; The Great Appalachian Coal Measure; The Illinois Coal Field; Extent and Distribution of the Quartzous Grit and Carboniferous Limestone, or the lower Divisions of the Carboniferous Series; Devonian and Silurian Rocks, or the older Fossiliferous Strata, as found in Indiana, Ohio, Wisconsin and Iowa, at Nashville and other Places; Sketch of the Geology of Southern Missouri and the State of Arkansas; A Reference to the Ideal Sections of the Formations as they appear above the surface of the Great Basin of the Mississippi.....By H. A. PROUT, M. D., of St. Louis, Mo., 243

IV. PUBLIC EDUCATION.—The Influence of Education upon the Moral and Social Condition of the People; The Importance and Advantages of Education as an Agent, in Developing the Resources of the Country.

By EVANS CASSELBERRY, Esq., a member of the St. Louis Bar, 253

V. STEAM NAVIGATION TO CHINA.—The Circle Route from the shores of the Pacific in America, to China; Difficulties and Objections to a Commercial Route across the Isthmus; Rail Road Projects across the Continent, &c.
By M. F. MAURY, Lieutenant in the U. S. Navy, 259
VI. HISTORY AND HABITS OF THE POTATOE, by E. MALLINCKRODT, St. Louis, 275

SCRAPS FROM THE EDITOR'S TABLE.

THE VERNAL SEASON..... 276

THE PORK TRADE OF THE WEST.

NUMBER OF HOGS SLAUGHTERED IN THE WEST IN THE YEARS 1834, '5 and '6; Number of Hogs Slaughtered at the different points in Ohio, Indiana, Illinois, Missouri and Kentucky; Number of Hogs Slaughtered in 1847-'8, at different points on the Ohio, Mississippi, Missouri and Illinois Rivers; Number of Hogs Packed at St. Louis in 1847-'8; Number of Hogs put up each year in Cincinnati, from 1833, and the Prices at which the Market opened; Price of Pickled Pork in New York, from 1823 to 1847, inclusive; Quantity of Pork shipped to Foreign Countries..... 277

COMMERCIAL STATISTICS.

EXPORTS FROM GREAT BRITAIN TO THE UNITED STATES.—An Account of the declared Value of the various articles of British Produce and Manufactures, exported to the United States for each of the past seven years, ending on the 5th day of January, 1847; Aggregate value of Exports from Great Britain to the United States; Imports into Great Britain from the United States, for each of the past seven years, ending on the 5th January, 1847; Export of Breadstuffs from the United States to Great Britain, for the six months ending on the 4th of March, 1847, and for six months ending on the 4th of March, 1848.....280 to 284

MANUFACTURES IN ST. LOUIS.

J. B. M'KOWN'S BELLOWS MANUFACTORY..... 284

MINES AND MINING.

MISSOURI COPPER..... 285
IRON: A SHORT SKETCH OF ITS PRODUCTION.—By Dr. FEUCHTWANGER.—The St. Louis and Birmingham Mining Company..... 286
NOTICE OF SPECIMENS, ORES, &c., RECEIVED FROM F. WOOLFORD, of Caledonia..... 287
OUR EXCHANGE LIST..... 288

THE

WESTERN JOURNAL.

Volume I.] MAY, 1848. [Number V.

ART. I.—SLAVERY IN THE UNITED STATES.

Although man is so constituted that by the aid of artificial means he can exist upon every part of the globe, yet, both his physical and moral condition is greatly influenced by climate and other physical causes. The effects flowing from these causes, and the influence which they exert over the individual and social character of the inhabitants of the several divisions of the earth, are legitimate subjects of inquiry for the natural and social economist, and address themselves to the consideration of the people of every country.

These influences impress themselves upon the moral, political and religious institutions as well as upon the philosophy of every people, and finally give direction to their destiny. The statesman, the philosopher, or the divine, who has not made himself acquainted with this subject so as to enable him to perceive and appreciate its bearings upon the human character, is, to a great extent, incompetent to discharge the duties of his functions, and therefore liable to do injury, rather than to promote the cause in which he labors. The inhabitants of every clime are continually operated upon, and acting under these influences, without perceiving their force; and each wonders at the stupidity of those of other and different climes, in adopting and observing habits and customs so different from their own. He, therefore, who shall endeavor to remove and obliterate these influences must labor in vain; they are part and parcel of man's nature, and cannot be eradicated. They are, however, subject to modification, and are the legitimate agents to be used in giving direction to the genius and civilization of the people of every climate.

To the people of the United States, this subject is one of more than ordinary interest, arising from the fact that our territory extends through so many degrees of latitude, and embraces so many different interests.

The population of the United States, although coming principally from the same region, began to exhibit the effects of climate shortly after its settlement in

this country. In traveling from Maine to Georgia, the change is so gradual that we scarcely perceive it until we have arrived at the end of our journey; then, if we look around us, we shall find ourselves in the midst of a people differing from those we had seen in Maine in almost every thing which meets the eye, or addresses itself to the ear. We shall find the people here engaged in pursuits adapted to the climate, and cherishing an institution which the northern people have long since abolished, because it was not suited to their latitude. The philosopher would appreciate these facts and perceive the true cause; but he would find no reason to condemn the southern people for retaining this institution, nor would he discover any merit in those of the north for abolishing it. He would see that both had acted in obedience to the laws of natural economy, operating through the agency of climate, and would be surprised to find that this institution should have become the subject of much excitement and unkind feeling between the people of the north and those of the south.

Looking with painful emotions upon the excitement and disquietude arising from the institution of slavery in the southern States, and being satisfied that the origin of this excitement can be referred to no adequate and just cause, we are induced to offer the result of our reflections upon the subject. In doing so, we shall endeavor to place it upon what we esteem its true basis, and discuss it upon the principles of natural and social economy.

Man requires more exercise, as well as more food and clothing, in a cold than in a hot climate. These demands stimulate him to both physical labor and mental improvement. But in high northern latitudes the long and severely cold winters allow of so little profitable employment in the year, that the labor which can be performed during summer is barely sufficient to supply the wants of winter, and the progress of civilization is retarded from a lack of accumulated wealth, and of commercial and social intercourse with more favored climes. As we proceed towards the equator, the physical inducements to labor gradually lose their power, and moral and social inducements are substituted in their stead.

In the temperate zone these two—the physical and moral inducements—combine to produce the highest state of civilization to which man is capable of attaining. Here the necessity of providing for winter is sufficient to stimulate him to labor during the other seasons, and his labors producing more than is required for the mere wants of existence, a surplus accumulates and constitutes wealth; and thus a portion of the inhabitants are, to some extent, relieved from the necessity of appropriating all their time and labor to the production of articles of mere necessity, and employ themselves in improving the mind and in producing works of art.

Proceeding still further towards the equator, we find man in the torrid zone almost exempt from the necessity of labor. Here nature produces spontaneously almost every thing which he requires for food; he requires neither shelter nor clothing to protect him from the cold; and lacking those powerful physical influ-

ences which stimulate the inhabitants of colder climes, he becomes indolent and prone to relaxation of both body and mind. His propensities and passions, stimulated by the climate, gain the ascendancy over his moral nature, and he remains in ignorance, and the worst state of barbarism, perhaps, known to man.

Although this is a condition naturally arising from climate, it is not, however, a necessary and inevitable result. In regard to climate, the inhabitants of the tropics were more favored than those of any other part of the earth; relieved from the strong physical necessity of labor, which was imposed upon the inhabitants of colder regions, they were in a condition to appropriate more of their time to intellectual improvement, and to the general purposes of civilization. The advantages afforded by the climate were equal to a vast amount of accumulated wealth, which, if properly appreciated, would have made them the most enlightened people of the earth. From these causes we should naturally look to the region of the tropics for the earliest dawnings of civilization; and, so far as we can trust history, this was the case in the old world, and the monumental ruins of Central America bear evidence that it was also the case upon this continent. It may be asked why this early state of civilization was not sustained and improved? We answer, because the natural advantages of the climate, constituting a condition of wealth similar in its consequences to the large accumulated wealth in other climates, the inhabitants of the former, like the wealthy individuals of the latter, indulged in idleness and vice, which sooner or later, inevitably results in degradation. As well might we expect that the rich and luxurious citizen of Rome, in the days of the Empire, would go out to labor, as that the African would leave the cool shade, and expose himself to toil under the direct rays of a tropical sun, unless urged to it by some powerful physical cause. And hence it is, that slavery has always existed in some form or other in Africa, and other tropical regions. And whether the institution be *domestic or political, the rod is the same and only impelling power*, and without its influence the inhabitants of these regions cease to labor and to enlarge the means of supporting an increase of population. By continued wars, and the sale of captives into slavery, the increase of population is prevented; and thus they are made the instruments of thrusting themselves out of the land which they refuse to cultivate, and are compelled to labor in foreign climes. These are the causes which have sent the Africans to our shores, and placed them in the hands of our ancestors, from whom they have descended to the present generation. That the condition of the Africans has been greatly improved by their transportation hither, no one can doubt who has any knowledge of the present condition of the race in this, and their own country. And, while working out their own improvement, they have been made a powerful agent in promoting the advancement of civilization throughout christendom, and, perhaps, throughout the whole earth. By the great surplus which they produce over the quantity which they consume, an immense addition is annually made to the wealth and comfort of all nations who, either directly or indirectly, participate in

our commerce. This, of itself, is almost sufficient to account for the unparalelled improvement which has taken place within the present century in the condition of the poorer classes of the countries with which we have commercial intercourse. Without this institution it is altogether probable that neither cotton nor sugar would, up to the present time, have been cultivated in this country as an article of commerce. Hitherto slavery has been the most important agent in developing the resources of every part of the country, as well in the north as in the south; and we can perceive no reason why the agency of slave labor will be less important to our future prosperity than it has been to the past. The mind of the civilized world is awakened to the subject of ameliorating the general condition of labor; and while this mighty change is progressing, it is important that it should be sustained by some great source of over production, like that of slave labor in the United States—for, if such a revolution should happen as would materially reduce the quantity of cotton grown in the United States for a series of years in succession, it would produce a revulsion in the leading pursuits of both Europe and America, which would seriously retard the improvements of the age.

But with all these causes and effects in view, there are those in the United States, who are ever laboring to produce excitement in regard to Slavery. The original agitators were of that unfortunate class of individuals who are more zealous than wise. Seizing upon the abstract proposition that slavery is an evil, they overlook all the causes which may have led to its existence; they are blind to the effects which it is producing upon the slaves, as well as to the advantages which are evidently accruing to the rest of the world; and more than all, with a total disregard of the rights of the owner, and the laws of the country, and at the hazard of a servile war, they would set the African free. These are the fanatics, whose numbers we believe to be small, and we sincerely hope that no occasion will arise that will tend to increase them. But, although few in number, they are ever active and vigilant in pursuing their object, and notwithstanding they are blind in regard to every thing else, they are shrewd in regard to this. They understand as by instinct the kind of individuals upon whom they can operate and bring over to their faith, and are ever on the watch to acquire influence in the politics of the country. The demagogue, (a fanatic also in one sense of the term,) always upon the look out for strength, is ever found ready to serve those who will promise him support—and thus a league is formed between these two disorganizers, whereby the quiet and happiness of a nation is disturbed.

We are, however, constrained to believe that there are very many good and sensible individuals among those who are denominated abolitionists, who conscientiously believing that slavery is an evil—and, perhaps, a national sin—and not having examined the subject, feel it their duty to act with the opposing party, without apprehending the injury which may result from such a connection. Such individuals are still open to reason, and to them we desire to address our views.

In the first place, it requires no argument to prove, that the government of the United States has no power to control in any way, the subject of slavery in the several States. Nor can it rightfully object to the admission of the people of a territory into the Union, upon the ground that their constitution recognizes the institution of slavery. Nor do we admit that within the spirit of the constitution, Congress possesses the right to prohibit slavery in the territory of the United States; for the reason that all territory belonging to the general government ought of right to be free to the citizens of every State, and that they ought to be protected in the possession and enjoyment of any property, the right of which was guaranteed to them by the State from which they emigrated; otherwise the owner of slaves could not settle in a territory without making a sacrifice, not required of him from a non-slaveholding State.

It is not, however, our purpose to argue a question of constitutional law. Congress has long since agreed upon a line of compromise, and we hope that all parties will religiously observe it. But all this discussion in regard to the territorial boundary of slavery, is a war with shadows. There is no danger that slavery will proceed north, and if it were legalized to the latitude of forty-nine degrees it would make little or no difference in the final result. Natural laws will in time overrule all legislative enactments. White, or free labor from the north, will press upon slave labor and take its place, until the white laborer has reached a climate uncongenial to his nature. By the operation of these laws, the more northern slaveholding States will abolish slavery, and as the Africans move south, there will continue to be fewer white men mixed with them, until the two races shall be separated; this result must sever the relation of master and slave, *and change the domestic into a political institution.* This will place within the tropical regions of the American Continent, a race of men who in their physiological conformation, were created for the climate. Enured to labor, practically acquainted with the useful arts, and purged from the barbarous customs and superstitions of their race in other countries, they will make the tropical portion of America the most productive part of the globe. The continent being narrow in this region, this population will occupy it from sea to sea, and hold a position which will enable it to supply both sides of the continent with tropical products, from Kamschatka to Terre del Fuego, on the west, and from Cape Horn to Labrador, on the east. By no other race of men can this region be made so productive, and their location here will give immense force to American commerce, and to American institutions. For the purpose of consummating this result, the United States must continue in some way, to influence and control the African population. The particular character and form of the relation which will exist between the two races must be determined by the circumstances as they arise.

But the time must arrive, when by the increase of the population of both North and South America, the white race will press upon the tropics from both sides, as to crowd the increased population of the black race. This will induce the

latter to emigrate, and turning their faces east, they will cross over to Africa and repossess themselves of the land from which their ancestors were thrust by reason of their barbarism. In their return they will carry with them our political, social and religious institutions; and thus Africa colonized from America will become civilized and christianized through the medium and agency of slavery. Before returning to Africa, they must pass from a state of bondage into a state of comparative freedom, that they may learn the duties of citizenship, and the science of government—for he who has been a slave, is unfit to be a citizen. In support of this proposition we have the example of the Children of Israel, who under the direction of the wisest law-giver the world has ever known, or as perhaps we ought to say, under the immediate direction of the Almighty, were not allowed to enter the promised land until all those who were born in slavery had been wasted in the wilderness.

Thus we have sketched what we suppose, and believe to be the future destiny of the negro race upon this continent. These views are not offered in the spirit of prophecy, but we esteem them as fair and legitimate deductions and conclusions from the laws of natural and social economy, which in the end we believe will prevail over all human power.

When we contemplate a map of the globe we perceive the continent of America stretching from north to south, through every habitable climate, between the two poles; and if the fact be true, and we believe it is, that the white race is not adapted to the labor of the tropics, and that owing to his color and physical conformation, the black is especially fitted for it, no proposition can be more clear than that for the purpose of developing the resources of the continent, to their greatest extent, besides conforming its population to the laws of climate and of natural economy, it was necessary that the black race should, in some way, be brought to this continent. They possessed no means of coming here as free men, and could only come as slaves, and the vices by which they had been degraded, prepared them for that condition. They could not be sent direct to the tropical regions of America, for the inhabitants there were in but little better condition than themselves, and were incapable of improving their condition. They were, therefore, made the agents of developing the resources of a more temperate clime, and of hastening the progress of modern civilization. And while aiding in this great work, it was designed that they should become thoroughly purged of the superstitions and barbarous customs of their own land, and learn the arts of civilization among the most enlightened people of the earth.

Under this view of the subject we are fully persuaded that any plan contemplating the emancipation of the slave without connecting with that plan his transportation from the country, is calculated to injure or retard the cause of final emancipation. And that even those charitable and philanthropic individuals who liberate their slaves from the best of motives, act unwisely, unless at the same time they make adequate provision to send them to Africa under circumstances

which will enable them to sustain themselves as intelligent members of an enlightened community. It is the policy of all the slave States to inhibit free black persons from coming within their limits to settle, and therefore, as slavery progresses south, the free blacks must be left among the whites; this is an unnatural condition, and one, in our estimation, much more to be deplored than bondage. Thus circumstanced, they necessarily constitute a caste destitute of political privileges, and by reason of their complexion they can have no social intercourse with the whites upon equal terms, and hence are deprived of the strongest inducements to moral improvement. With such limited objects of aspiration, it is not in the nature of things that they can ever become respectable; and while they become degraded in their own character, they are contributing nothing by their labors to benefit the balance of mankind. That this part of our colored population is degraded and useless, both to themselves and to the country, without the slightest hope of amendment, will be attested by every intelligent individual who has had sufficient opportunity of observing them; and it may be reasonably doubted whether, if the entire mass was transported to Africa in their present condition, they possess sufficient intelligence and energy to sustain them in a state of civilization.

We admit the abstract proposition that slavery is an evil; but we deny that as citizens or christians, men have a right to remove this evil by transgressing both the moral and civil law. More especially when, as in the present case, in all human probability, the removal of the evil complained of would be the means of inducing others more to be deplored.

In regard to the civil right of the slaveholder to his slave, it rests upon the same foundation as does our title to the soil in this country—both have been acquired upon the same principle; and as well might it be expected that the present owner of a farm in New England would yield it up to the descendant of some Indian tribe from which it was obtained some two hundred years ago, because no valuable consideration was paid for it, as to expect that the present owner of a slave would set him free, because it was proven that his ancester was sold into bondage without his consent. The aborigines of America, resisting every influence designed by the Creator as inducements to civilization, and disdaining to till the soil for the support and increase of the race, were doomed to surrender the country to a people who were willing to cultivate and extract from the earth the means of supporting a larger number of human beings, and a higher state of intelligence.

Had such abstract right to the soil as the Indians claimed, been recognized by the Europeans, and had their objections to the settlement of the white race been regarded, one-third of the habitable and productive portion of the globe would have remained unappropriated to the use of man; and the provision made by the Creator for the support of a very large number of human beings would have remained unavailable. Such a state of things would evidently have contravened

the laws of natural economy; for God hath given to those who obey these laws "the heathen for an inheritance and the uttermost parts of the earth for their possession."

The African race were in the same category with the American Indians: they had resisted all the influences ordained by the Creator, as inducements to intellectual and moral improvement. Instead of availing themselves of the advantages which the climate and the natural productions of the earth afforded them, they refused to labor; and when these natural resources were exhausted, like the Indian, they disdained to cultivate the soil for the purpose of producing the means of sustaining an increased population; and hence they sunk into the lowest state of barbarism, and became the subjects of the most odious vices and superstitions. From these causes they were divided into small tribes, and by desolating wars, and the sale of captives into bondage, they kept the increase of population within the natural resources of the country, thereby violating the laws of both natural and social economy. *Under such circumstances, had the climate of Africa been congenial to the white race, the civilized white man, acting under the same laws which brought him to America, would no doubt have taken possession of Africa.* But this part of the earth was created for the black race, (or perhaps we should say, the black man was created for the country,) and hence, it was protected against the incursions and settlement of the whites, by the peculiarity of the climate. This being the case, the barbarism and cupidity of the people became the agents of thrusting themselves out, and sending them in bonds to foreign lands. Not so much, perhaps, to expiate in a state of slavery the enormity of their crimes, as to enforce upon them the arts of civilization, and a knowledge of the christian religion. In this we can perceive a mercy and kindness extended to the African which appears to be denied to the Indian; for, while we see a prospect of improvement and restoration to the African race, nothing less than total extinction seems to threaten the American Indian. And thus the Africans in bondage are made the agents of producing the means of facilitating the progress of civilization in other lands and nations, while at the same time and by the same means, they are preparing the way for the civilization of themselves, and of their own country. Those who do not, or will not recognize the hand of Providence in this two-fold purpose of African slavery, appear to us as blind as were the Africans themselves, before their expulsion from their own land.

But these pseudo philanthropists insist that it is time to set the bondsman free. How do they know this? What warrant have they for this opinion, and how dare they sit in judgment between offended Deity and an offending people? Have they penetrated the designs of Providence and discovered the fact that all the benefits intended to be derived to other nations from African slavery, have been accomplished? Or, are they prepared to say that if the Africans were now liberated from bondage, that they are sufficiently enlightened to enable them to sustain a state of civilization? We are fully persuaded that these things have

not yet been accomplished, and that the time has not arrived for the emancipation of the African of the United States; he has not yet worked out his destiny, or fulfilled the years of his captivity. When the fulness of time shall arrive, the relation of master and slave will be dissolved by the operation of natural laws, acting upon the condition of both, as well as upon the country to which they reside. When these things conspire to bring about the emancipation of slavery, then, and not until then, will the fruit be ripe—and it will require no foreign hand to pluck it. The time and mode of finally dissolving this relation is beyond the scrutiny of man, but if left to the direction and control of natural laws, it will be effected without violence.

We are fully warranted in saying, that as christians, these agitators are greatly violating the precepts of the religion which they profess. In agitating a discussion tending necessarily to disturb the relation of master and servant, creating bitterness and jealousy in the heart of the master on one hand, and dissatisfaction and disobedience on the other, they are doing that which they would not that others should do unto them in like circumstances.

In aiding slaves to escape from the service of their masters, they violate the laws of the land, and disregard that precept which requires submission to the laws that be. Instead of exhorting servants to obey their masters as did the great Apostle, they excite him to rebellion and disobedience. Paul returned the slave to the master, but these modern fanatics seek to steal him away.

The violation of these, and many other of the plainest precepts of christianity, are so gross and palpable that there is no ground left whereupon the most ignorant can excuse themselves, and those who are guilty of such practices stand convicted before both God and man, of unmitigated crime.

We exhort such as have attached themselves to the anti-slave party from pure motives, (and we doubt not, but there are many such) to examine this subject carefully and without prejudice, both as citizens and christians, and if they find that the prominent leaders in this agitating subject are violating the laws of the country, as well as the most obvious precepts of christianity, then let them withdraw from all fellowship and communion with them.

Let none be deceived by that most dangerous of all doctrines, that the end justifies the means; this doctrine is reversed in the christian philosophy, which teaches that the means alone can justify the end.

If it should be objected that the period of emancipation which we have endeavored to foreshadow, is altogether too remote and improbable to satisfy the ardent zeal of the philanthropist, let it be remembered that the destiny of nations is controlled by certain irrevocable laws; such as we have endeavored to illustrate, and which are usually denominated "divine providence," and that these laws must ultimately prevail against all human obstruction, and that obedience to these laws constitutes the highest wisdom of man, and resistance his greatest folly. If these laws should be appreciated and observed by our people, we must rule the

destiny of this continent, not by the sword, but by the force of our institutions, which will open the way before us as speedily as it will be safe and expedient to extend our borders. The several governments within the tropical climate of America may almost be said to change with the seasons; nor is there any indication of their becoming more permanent in their character. Worn out and ruined by these revolutions the people will, in due time, seek protection under the physical and moral power of the United States, and receive our black, as well as our white population."

If our population should continue to increase at the same rate as it has since the year 1790, we shall number three hundred millions of inhabitants in about ninety years from the present date. Forty millions of this number would be blacks. Now, it must be evident to every observing mind, that forty millions cannot be profitably employed in the present slaveholding district of the United States, and that long before they reach that number, they must be liberated, or otherwise progress south under our control. We perceive no reason to doubt that under our free and enlighted institutions, the increase of our population will sustain its present rate, until it reaches three hundred millions. If this should be the case, there are many now in being, who will live to see the destiny which we have supposed to await the American slave, consummated.

The scheme of colonizing the free people of color in Africa according to the views of the colonization society, is alike beautiful and philanthropic; and altogether worthy of the great and good men who have advocated and sustained it. If wisely managed, it is capable of doing great good, as well by relieving the country of a portion of this colored population, as in forming a nucleus for the settlement of the race there, when they shall begin to emigrate upon their own resources. If this colony should be sustained, and gain strength under the auspices of the society—aided by our government—it will constitute the germ of the future civilization of Africa. And, although composed of humble, and mostly of illiterate constituents, they will commence their career at a higher point in the scale of civilization than have any other people upon earth. Much higher than did the Anglo-Saxon race on this continent; for they came here under the influence and auspices of a monarchical government—of an established church, and laws recognizing an aristocracy, and the rights of primogeniture, with other customs and prejudices detrimental to the advancement of civilization. The African colonist will be free from all these hindrances in the beginning, and will start in advance of every other people upon earth, except ourselves. Under such circumstances we are warranted in expecting the best results.

Here, then, is a labor in which all may unite with a clear conscience, and without offence to any. The field is sufficiently extensive to give full scope and employment to the sympathy and charitable efforts of the anti-slave party; and one from which, if cultivated with skill and diligence, they may safely calculate

to reap a sure and rich harvest. Then let them unite in this great work, and redeem themselves from their past follies.

We freely admit that we feel no apprehension that the anti-slave party will be either the cause of dissolving the Union, or of materially changing the destiny of the slaves; still we look upon their efforts as the cause of much evil. The agitation of this subject is calculated to alienate the feelings of the people of the south from those of the north. The southern people feel that their rights have been wantonly assailed, and that their peace of mind and personal security, as well as their property, are endangered by the unwarrantable practices of those of the north. The agitation of the subject in the councils of the nation tends to establish a system of sectional legislation, and to embarrass the action of Congress upon all subjects of a general nature; and statesmanship, with a few honorable exceptions, consists in legislating for the territory either north or south of Mason and Dixon's line, and in managing so as to obtain an advantage over those who happen to live on opposite sides. These are evils greatly to be deplored, and deserve the condemnation of every good patriot. Agitation is the bread of life to the mere politician and fanatic, and if the people of the United States were wise, they would deprive these worthies of this pabulum, and by keeping quiet, permit them to die.

Thus have we endeavored to trace the institution of slavery in the United States to natural laws, and to show that it *is* the consequence of disobedience. We have also endeavored to show, that the time has not arrived when the slave can be liberated with advantage to his present or future condition; and have sketched out what seems to our mind, the natural and final destiny of the African race. We have also suggested some of the evils arising from the present agitation of the subject. Our object is to direct the minds of the agitators to what we believe the true and philosophical mode of considering the entire subject, and if possible, to guard them against the commission of evil, while they are aiming to discharge what they esteem a duty.

We most ardently desire to remove every cause which, in any way, tends to cherish sectional prejudices, and sectional legislation; for we are fully persuaded that these constitute the most formidable and dangerous obstructions which lie in our way to national greatness. Before these causes can be removed, we must adopt and inculcate a more universal system of philosophy. We must study the principles of natural and social economy, and, as far as may be practicable, conform our present incongruous and ill-digested systems of morals and philosophy to the laws of nature, as promulgated throughout her works. From these, and from the Holy Scriptures, of which they are the best exponents, let us draw our rules of action, pure and unpolluted from the ignorance and vices of the past. Without this, we cannot become Americanized in the true meaning of the term. We cannot possess that universal sympathy which is required to make us one in heart as we are in name, and which alone can give full force to our institutions.

ART. II.—ELECTRIC LIGHT.

MESSRS. EDITORS:—I here furnish you an account of some experiments with the Electric Light. It is to be regretted that the subject has not elicited more votaries in its favor than it has, as it is calculated to supersede both the use of oil and gas. It is now about nine years ago since M. Achereau made his first public exhibition of the Electric Light, in the *Place de la Concorde*, in presence of the authorities and some four or five thousand of the inhabitants of Paris.

On one of the bases of the statues called the *Pavillion de Lille*, a glass globe, of apparently twelve or thirteen inches in diameter, with a moveable reflector, was fixed in connection with a voltaic battery; and, at a little before nine o'clock, the electric fluid was thrown into it by a conductor. At this time all the gas lights in the *Place*, (one hundred in number,) were burning. As soon as the electric light appeared, the nearest gas lights had the same dull appearance that oil lamps have by the side of gas. Soon afterwards the gas was extinguished and the electric light shown forth in all its brilliancy. Within one hundred yards it was easy to read the smallest print; it was, in fact, as light as day. The astonishment of the multitude was very great, and their delight as strong as their astonishment. The estimate of the power of the electric light, (made by scientific men,) is, that it is equal to twenty gas lights. The cost of apparatus would not amount to one-twentieth of the cost for the generation and application of gas. The electric light gives out no bad smell; it emits none of those elements which, in the burning of gas, are so injurious to health; and explosion would be impossible. The only danger would be at the battery; that, of course, should be attended by a competent person.

Internal lighting would be as practicable as external lighting. M. Achereau's experiment was performed with a voltaic battery of two hundred pairs, composed as follows: 1st. An outer globe of glass. 2d. In this globe of glass a cylinder of charcoal, open at both ends, and plunged in the nitric acid contained in the outer globe. 3d. In the cylinder of charcoal a porous porcelain vase, containing acidulated water, (with sulphuric acid,)—this replaces the cloth in the common battery. 4th. In the porcelain vase a cylinder of amalgam of zinc, plunged in the acidulated water. Two copper conductors from the second pole, and pointed with charcoal, led into an empty glass globe, from which the air had been exhausted. The two fluids, on meeting, produce a soft but most intense light. Should the thing work in general as on this occasion, it will work a dreadful revolution with gas companies. M. Achereau said that a company for supplying the electric light, would realize a handsome profit by charging one-sixth that is paid for gas. A Mr Slaite is lecturing in England on this new mode of lighting. At a soiree given by the Literary and Philosophical Society of Sunderland, this mode of lighting was the principal attraction. The Newcastle Guardian says: "The light, which was of astonishing brilliance and beauty, was placed under an air

tight glass vase; when the gas was turned down it sufficiently lighted the spacious building, and bore the closest resemblance to the great orb of day of any light we ever witnessed. The electric light was next exhibited in a vessel of water, with equal success. Mr. S. stated that it was the cheapest as well as the best, for all practical purposes. The marvellous invention was hailed with rapturous plaudits!" The New York Tribune says, in reference to this mode of lighting: "Its expense is not one-twentieth of the price now paid in this city for gas;" and I suppose that we, out west here, pay one-half more for our gas than the people in New York, and double the price the people do in England. Hence, it becomes the lovers of economy to look well to this subject—*light!*

St. Louis, March 25, 1848. J. M. P.

ART. III.—ON THE GEOLOGY OF THE VALLEY OF THE MISSISSIPPI.

On referring to the table of equivalents* which we offered in the March number of the Western Journal, it will be perceived that the order of super-position of the different mineral masses which enter into the constitution of the earth, is invariably the same, whether found under different names in the west, in New York, or on the eastern continent. Exceptions, however, to this uniformity in sequence have, in a few instances, been observed, but these are local in character, and generally limited to the junction of two formations.

In the State of New York, the Silurian and Devonian, or the older fossiliferous rocks, are more completely developed than in any other portion of the globe yet examined. England and Wales, in which these systems were first discriminated and classed as separate from other formations, furnish but few of the strata which are so abundantly displayed in the same series in New York, and in order to find a fair proportion of the latter, it even seems necessary to traverse the old continent in every direction, and to borrow equivalents from different, and often very distant, localities. The strata which are so multiplied and fully developed in the system of New York as to render it properly a standard of comparison for similar formations throughout the earth, are but imperfectly distributed in the great Valley of the Mississippi. Some of them, as we proceed towards the west, become more and more attenuated, and ultimately thin out, so that the stratum which rests upon them, and that on which they repose, are brought in juxtaposition; and on proceeding still further, one or both of these give out, and others, older and newer in the series, are found in immediate contact, so that only a few of the numerous strata of the New York system are prolonged and fully developed in the west. This extension of a few, only, of these formations—the superposition of the carboniferous system, and the absence of all the younger rocks

*Drawn from Mr. Verneuil's Parallelism of the Paleozoic Formations of Europe and America, and the reports of Dr. D. D. Owen. There are a few errors in the arrangement of this table, which the reader can correct by the text which follows.

intervening between the latter and the cretaceous or chalk group, impresses on western geology a simplicity which has never been observed in any other country of the same geographical extent.

As it will become necessary, in presenting a view of the geology of Missouri, to refer to formations existing in other States, we will here offer a sketch of the geology of the Mississippi Valley, in order that its relations may be more fully comprehended.

The Valley of the Mississippi embraces the immense region bounded on the east by the most elevated range of the Appalachian chain, on the west by the Oregon or Rocky Mountains, on the south by the Gulf of Mexico, and on the north by the elevated table lands which divide its waters from those flowing into Hudson's Bay, supporting the great chain of lakes emptying into the Gulf of St. Lawrence. This vast basin includes, in the greatest extension of its axis, about twenty-one degrees of latitude, and about thirty-two of longitude, or an area of 1,300,000 square miles. Formed on a scale at once grand and imposing; characterized by a beautiful and agreeable diversity in its surface; irrigated by a great central stream, deriving its branches from the remotest limits of its border; circumscribed in its northern and southern extension to the great temperate zone of earth; unparalleled in the fertility of its soil and the amazing variety of its products; and unrivalled in the extent of its yet undeveloped mineral resources, this valley offers, in an eminent degree, all those conditions which are most favorable to the physical, moral and intellectual nature of man, and to the great and leading developments which characterize every stage of his onward progress to the high destiny which awaits him.

In offering a geological sketch of this extended surface, it may be necessary to premise that observations are still required in some portions of the country, to render it complete in its details; yet, sufficient is known to furnish a correct general estimate of the character of its formations, and the extent of their distribution.

By commencing at its southern border, or at the Gulf of Mexico, and proceeding towards the north, we find that arrangement in its strata which enables us to begin with the younger, or more recent formations, and to descend regularly to those which are older in the series.

The sands, clays and pebbles which cover the general surface of every country, conceal, to a certain extent, the more compact formations. This *alluvium*, as it is termed, is supposed to have been deposited in lakes, bays and estuaries, by the transporting agency of running water, or in some cases by denudation, and a transfer of these materials by the ocean itself from changes in its geographical and dynamical relations. Constituting the general surface of every country, it forms the foundation of the soil, or that admixture of its earthy and saline matters with vegetable mould, which sustains the vegetable world.

Underlying this alluvium, we find a tertiary border, extending around the Gulf

of Mexico, occupying the lower third of Alabama, nearly all of Mississippi, Louisiana, and the southern part of Arkansas; towards the western plains its limit has not as yet been defined. This tertiary belt is only a portion of that belonging to the Atlantic sea-board, which extends with a variable width from New Jersey to the Gulf of Mexico. Sweeping around the southern termination of the Appalachian range in Alabama, it rapidly widens out as it is prolonged towards the west.

In Alabama there are two formations composing this group of rocks, which have a general inclination or dip towards the south, or from the termination of the Appalachian range to the Gulf of Mexico. The first or the upper is termed the Nummelite Limestone, (the Orbitolite of Mr. Lyell,) and is found cropping out in various places where the water courses have worn deep channels through the alluvium, particularly in the bluffs in the southern portion of the State. Below this imperfectly formed limestone, we find the second stratum, in a descending series, with the same dip towards the south. Its line of outcrop forms a narrow but interrupted band north of the Orbitolite Limestone in Alabama, and gradually widens out, forming a broad surface in middle and upper Mississippi, whence it extends to the southern part of Arkansas. This white and friable rock, commonly termed the rotten Limestone, from its disposition to undergo disentegration on exposure to the air, gives rise to the prairies which so frequently diversify this region. It abounds in a great variety of shells as well as the remains of the remarkable cetacen—the Zeuglodon of Professor Owen, or the Basilo Saurus of Dr. Morton.

In the great geological scale, the next class of rocks below the tertiary series, is the chalk, or cretaceous group. In the United States we find no formation corresponding in lithological characters at least, to the upper division of this group as it exists in England. No chalk, as yet, has been found, though the equivalents of the green sands and marls which underlay it, have been observed at various places through Alabama, Mississippi, in the extreme western portions of Tennessee and Kentucky, and on the banks of the Mississippi river, as far north as the mouth of the Ohio. These marly and argillaceous beds crop out in a narrow line through Alabama; but in Tennessee become much wider, forming the cold and barren soils of several counties west of the Tennessee river. From their border of elevation they dip towards the south and disappear under the tertiary group already referred to. At Wetumpka, in Alabama, they repose upon the Metamorphic or Crystaline rocks; further to the west, near Tuscaloosa, and thence onward through the State, they rest immediately on the micaceous sandstone or other members of the Carboniferous series.† Extended through the southern and western portions of Arkansas, these cretaceous rocks, as they circle around towards the northwest, acquire an astonishing development in superficial area. In Lieutenant Fremont's expedition, the fossils found from longitude

†Lyell.

96½ (or a little west of the Missouri river,) to Pike's Peak, through the enormous extent of nine degress of longitude, all belonged to the cretaceous group of rocks. But the extension of its beds towards the west is equalled if not exceeded by that which occurs more towards the northwest. From the mouth of the Sioux to the mouth of the Chienne, a distance, by water, of four hundred miles, Mr. Nicolet found the cretaceous group forming the hills which flank the right bank of the Missouri river, and which rise like steps towards the Rocky Mountains. He estimates the greatest width of the group here, at about two hundred and fifty miles, and thought it possible that it was prolonged in length to the mouth of the Yellowstone, a distance of one thousand miles northwest. Now, as the geographical features of the great western plains present a remarkable uniformity in their general character, it would not, perhaps, be generalizing too far to refer them, in their entire extent, to the cretaceous formation.

It will appear from this summary, that the cretaceous and the super-imposed tertiary group, or those more recently raised from the bottom of the ocean, taken together, constitute a great western and southern border on the surface of the Valley of the Mississippi. If the geological formations of this great basin corresponded to those of England, we should find the cretaceous reposing on the Wealden, the next group, in a descending series. But the Wealden, the Oolite, the Lias, the Triassic and the Permian groups, are all wanting in its geological structure, and we find in Alabama the cretaceous resting upon the carboniferous, or the coal bearing series, or in the absence of these, and other older formations, directly upon the metamorphic or crystaline rocks.

With some exceptions, from the border of this cretaceous formation in Aalbama, Mississippi and Arkansas, to the great lakes and the table lands between the head waters of the Mississippi and Missouri rivers, and from its eastern border on the great western plains to the middle range of the Allegheny Mountains, the surface of the Mississippi Valley may be considered as belonging to the carboniferous group of formations.

These exceptions include, 1st. A limited and isolated circle around the city of Nashville, where the Devonian and Silurian, seem to have penetrated through the carboniferous rocks, which, in general overlay them.

2. An anticlinal axis, unaccompanied by dislocation, extending towards the north, along the eastern border of Indiana, displays the older fossiliferous rocks on the surface of both of its sides. These, in nearly horizontal strata, form successive bands of varying width around it, covering the surface of most of eastern Indiana and western Ohio, and extending from the country immediately around Louisville, in Kentucky, nearly to the southern border of the State of Michigan. These Devonian and upper Silurian rocks are here extended to the northwest, around the border of the great Illinois coal-field, and probably occupy all the surface between this limit and the southwestern shores of Lake Michigan. As we proceed towards the northwest, we find the upper part of

Illinois, from Rock River, nearly the whole of Wisconsin, all of the northeastern portion of Iowa, together with a part of the territory of Minesota, extending even beyond the Falls of St. Anthony, composed of Devonian, or upper and lower Silurian rocks. All the region of country on the northeast, the north and the west of the limits of this series of formations here, is characterized by the prevalence of Plutonic, Metamorphic and Volcanic rocks, covered over to a great extent by drift, or boulder alluvion, which seems to have been swept from the northeast.

3. The third exception is found in most of the southern portion of the State of Missouri and western Arkansas. Here the Plutonic and Volcanic rocks, forming much of the surface, seem again to have elevated some members of the lower Silurian group above the horizontal plane of the carboniferous series.

4. The fourth and last exception is so trivial as scarcely to require notice—it is a small extent of country east of the Appalachian coal measure, in Tennessee, which is formed of Silurian, but more frequently of Metamorphic and Plutonic rocks. On comparing the surface occupied by these older formations, it will be seen that the carboniferous series of rocks overspreads about two-thirds of the great Valley of the Mississippi, exclusive of the more southern and western portions, characterized as we have shown by the cretaceous and tertiary groups.

In order that we may give a more definite idea of the limits of the separate formations which constitute the carboniferous system, we will describe them as they are found existing in and around the coal measure of Alabama, where they preserve perhaps greater uniformity in their order of arrangement, than in any part of the Valley of the Mississippi.

The first or upper division here consists of white layers of sandstone and grit, alternated with green and gray micaceous sandstone, ripple marked yellow sandstones—clays and shales, alternated, and enclosing beds of coal, varying in thickness from a few inches to several feet. These layers with the included coal, constitute what is properly termed a coal measure or a coal field.

The second division of the carboniferous series in general, underlaying the first, consists here of a coarse quartzose grit, resting generally on thin laminæ of sandstone or dark colored shales. This formation is the equivalent of the Millstone grit of England. This we shall term Quartzose grit.

The third or lower division is formed of thick beds of bluish limestone, with veins of calc spar intersecting them, and sometimes abounding in nodules of chert and hornstone. The lower beds of this division are very fossiliferous and yield an abundance of producta and encrinites, and the very characteristic fossil, the Archimides of Le Seur.‡ Its upper strata includes the pentremital limestone of Dr. Owen. It is the mountain limestone in the geology of England, which we shall term the carboniferous.

The Appalachian and Illinois coal-fields, which form such prominent and important features in the geology of the Valley of the Mississippi, display a most

‡Lyell.

extraordinary extension of the strata which belong to the first division of the carboniferous series.

The great Appalachian coal measure, exclusive of the anthracite, which belongs to the eastern slope of the Alleghanies, extends from near the southern boundary of the State of New York, to Tuscaloosa, in Alabama, a distance from north-east to south-west of 720 miles—its greatest width being about 180. We may form some estimate of its limits by adding together the sum of the surfaces occupied by it in the different States in which it is found. It may be said to occupy the western half of Pennsylvania, the western third of Virginia, the eastern fourth of Ohio, the eastern fifth of Kentucky, one sixth of Tennessee, near its middle division, and one ninth of Alabama. These proportions, calculated on the respective areas of these States, will show that it covers a surface of at least 73,000 square miles.

Its general form or outline varies much between its two extremes. Towards the north-east it is broad, and gradually diminishes in width until it reaches the confines of Alabama, where it ramifies, following the divisions which takes in the Cumberland mountain as it enters this State. One branch sweeps along the Valley of the Tennessee river one hundred miles towards the west; two others, parallel, each about ninety miles long and twenty broad, pursue the general direction of these ranges towards the south-west, until they dip under the nearly horizontal strata of the cretaceous and tertiary group, near Tuscaloosa.

This coal measure is peculiarly characterized by the extent and thickness of the sandstones which belong to it. Those in Pennsylvania, Virginia Ohio, and a part of Kentucky, furnish to the enterprize and industry of these States abundant supplies of three great elements of their prosperity—salt, iron and coal.

The Illinois coal-field, though separated from the Appalachian, was, no doubt, originally connected with it, until denudation of some portions of the intervening surface exposed the strata which belong to the lower division of the carboniferous series and the older fossiliferous rocks of the Devonian and Silurian eras. This coal measure extends from near the middle of western Kentucky, in a N. N. W. direction, to the mouth of Rock River, in Illinois, and a short distance beyond it, west of the Mississippi, in Iowa. Its length is about 380 miles—its width about 200. From its nearly rhomboidal form, 170 miles may be assumed however as its average width; these numbers would give it a superficial area of 64,600 square miles—a surface exceeding that of any State in the Union, except Missouri, and almost equalling the whole area of New England. It extends over the surface of several counties in Kentucky on the Green river, over the southern third of the State of Indiana, the whole of Illinois, except that portion which lies north of a direct line from the mouth of the Kankakee to the mouth of Rock River, extending across the Mississippi at St. Louis, it is found occasionally flanking its right bank, to its termination in Iowa. If we consider the Osage coal measure as a mere prolongation of this great coal-field to the west, of

which there can be little doubt, the superficial area of the latter would be greatly increased ; as we have evidence to show that it is an extensive formation, and will at some future day prove of immense importance to the interests of the State.

The extent and the limits of the coal bearing strata are more easily defined than those of the two lower divisions of the carboniferous group of formations. The millstone grit of England, perhaps, finds an equivalent in the conglomerate and millstone grits of Ohio, and the sandstone which spreads such general sterility over eastern Kentucky. It seems that on the western flank of the Alleghanies, the quartzose grit predominates, from the borders of the coal measure sandstone, to the middle of Ohio, where it falls immediately on the Waverly sandstone, which reposes in turn on the Devonian rocks, and to the middle of Kentucky, where the upper carboniferous limestone strata, are first observed. The carboniferous limestone increase in power towards the south and southwest, or through Middle Tennessee and North Alabama; while the quartzose either diminishes or thins out, so as to bring the sandstones of the coal measure often in direct contact with the carboniferous limestone.

The two lower divisions of the carboniferous group bordering the Illinois coal field on the east, are well defined. The quartzose sandstone, (here a millstone grit,) and the carboniferous limestone, often Oolitic, form successive borders; the first underlyaing the coal measure, and the latter reposing upon the Devonian black shale of Kentucky and Indiana. On the northern outline of the coal fields at Rock Island, these strata, as well as the upper members of the Devonian, have thinned out so that the coal measure here rests directly upon the cliff limestone, or the upper Silurian rock. On the southwestern border of this coal measure on the Cumberland and Tennessee rivers, the coal measure sandstone is prolonged into an extensive formation, and probably furnishes most of the iron ore which is so abundant in this region. Of the distribution of the two lower divisions of the carboniferous group west of the coal measure, little is known. The carboniferous layers crop out and become quite Oolitic in the vicinity of Ste. Genevieve. At Chester, in Illinois, I found them dipping towards the southeast and underlaying a sandstone which is probably the equivalent of the coal measure sandstone. The carboniferous limestone forms the foundation on which the city of St. Louis is built, and coarse grain sandstones, becoming more bulky towards the west, overlay it, which are probably members of the coal measure group of sandstones. These sandstones, with the underlaying carboniferous strata, extend from near Herculaneum to the western border of the State, forming a band south of the Missouri river of varying extent, which underlay the coal measure of the Osage. The carboniferous limestone and the coal measure sandstones are found on the banks of the Missouri, from the western limits of the State to the mouth of the Sioux, when they give place to the cretaceous group, which borders them on the west. The extent and nature of the strata which underlay the coal measure of Illinois on the west, from the mouth of the Missouri to its northern limit in

Iowa, is but imperfectly ascertained, from the thickness and uniformity of the alluvium which characterizes this region. But from the carboniferous rocks being found on the banks of the Mississippi to the mouth of Rock River, on the Des Moines to the mouth of Raccoon river, and on the Missouri to the mouth of the Sioux, it is probable that the whole of north Missouri and southwestern Iowa are characterized by the general prevalence of these formations near the surface.

In endeavoring to define the limits of the carboniferous formations in the Valley of the Mississippi, we referred to the distribution of the Devonian and Silurian groups, which are elevated from their general position beneath them to the surface, forming the prevailing rocks of certain districts. The members in these groups are of so much importance as to require a more extended notice. The blue limestone, the equivalent of the Trenton and Hudson river group of New York, and the lower Silurian of England, is found at Cincinnati, forming the middle or slightly elevated portion of the anticlinal axis, which extends towards the north in eastern Indiana. Forming the middle of this axis for some distance, it disappears below the strata super-imposed above it on both sides. On the eastern and western flanks of this axis, we find in succession, reposing on the blue limestone, in broad bands, or successive nearly horizontal borders of varying width, first, the cliff limestone, the equivalent of the Clinton and Niagara groups of New York, and the upper Silurian of England; then, above this, the corralline beds, the equivalents of the Onondaga limestone and the corniferous limestone of New York, (the Devonian of England;) then the shell limestone, the representative of the Hamilton and Tully limestones of New York, (the Devonian of England;) and lastly, the black bituminous shale, the equivalent of the Genessee slate of New York, (the Devonian of England.) This black bituminous shale, the youngest member of the Devonian group, disappears on both sides of this anticlinal axis under the strata of the Illinois coal field on the west, and under those Appalachian coal-fields on the east. The surface covered by them in their successive out crops, includes most of western Indiana and eastern Ohio. In the northern part of this district, they disappear under the drift alluvium which covers here the general surface of the country. As the out crops of these strata circle around the coal measure of Illinois towards the northwest, the cliff limestone widens out, while the others, for the most part, disappear or form very narrow bands between it and the coal strata. This increase in the cliff limestone gives it great extension on the northern border of the Illinois coal field, where it occupies the whole surface of Illinois north of the coal measure, all of Wisconsin to the Wisconsin river, and is prolonged over the surface of much of the northeastern part of Iowa.

In Wisconsin and Iowa it forms *the lead bearing rock* of the mineral district, and abounds in excellent beds of iron, as well as in copper and zinc. At Rock Island it is found dipping under the coal measure which here seems to be deficient

in the carboniferous limestone and the quartzose grit, or the two lower divisions of the carboniferous series. On the north, at the Wisconsin river, it is found reposing on the blue limestone which here has become quite thin, compared with its great thickness at Cincinnati.§

On the Wisconsin river, below the blue limestone, saccharoidal sandstones, alternated with other magnesian limestones, make their appearance and constitute perhaps, the oldest division of the Silurian group found west of the Alleghanies. Dr. Owen, with much plausibility, infers that these are the equivalents of the Magnesian limestones, which form the lead bearing rocks of Missouri—being the equivalents of the Potsdam sandstone, the Calciferous sandstone and the Black river limestone, of New York, and perhaps of the compact limestone at Frankfort, Kentucky, and the sandstones on the south of it towards the Alleghany mountains. These Magnesian limestone and Sandstone strata are raised upon an anticlinal axis at Lake Pepin; beyond which they again dip under the blue limestone which is seen reposing on the sandstone at the Falls of St. Anthony. Towards the north these older fossiliferous strata come in contact with the Plutonic and Volcanic rocks which abound in this region, and are covered over by alluvium or boulder drift, which extends from sources of the Mississippi and Lake Superior, towards the south-west.

At Nashville, Tennessee, the blue limestone makes its appearance again, through the Cliff limestone and the Bituminous Shale. These Silurian and Devonian rocks here form a small insulated surface, surrounded on every side by Carboniferous rocks, superimposed above them. Some of these formations crop out again in Perry county, in the same State. In a recent visit to the south, I found the encrinital limestone of the carboniferous series reposing on the black bituminous shale of the Devonian, at the upper ford of Shoal Creek, in Lauderdale county, in Alabama. This is, perhaps, the most southern outcrop of these older formations.

It remains, in order to fill up this condensed and imperfect sketch of the geology of the great Valley of the Mississippi, to refer to the character of the formations in the southern portion of Missouri, and nearly the entire State of Arkansas.

The surface of Missouri south of the carboniferous series which extend below the Missouri river for a short distance, is characterized by the prevalence of a magnesian limestone, sub-crystaline in its texture, and perhaps entirely destitute of fossils. Over this reposes, in some places, a semi-vitreous sandstone of compact texture, which, when broken in its connection, is found in angular fragments covering many of the hills. It is impossible, from the almost entire absence of fossils in these strata, to refer them to their equivalents in the great geological scale. Dr. Owens, as we have seen, suggests that they are the equivalents of the oldest strata of the Silurian group, which appear below the blue

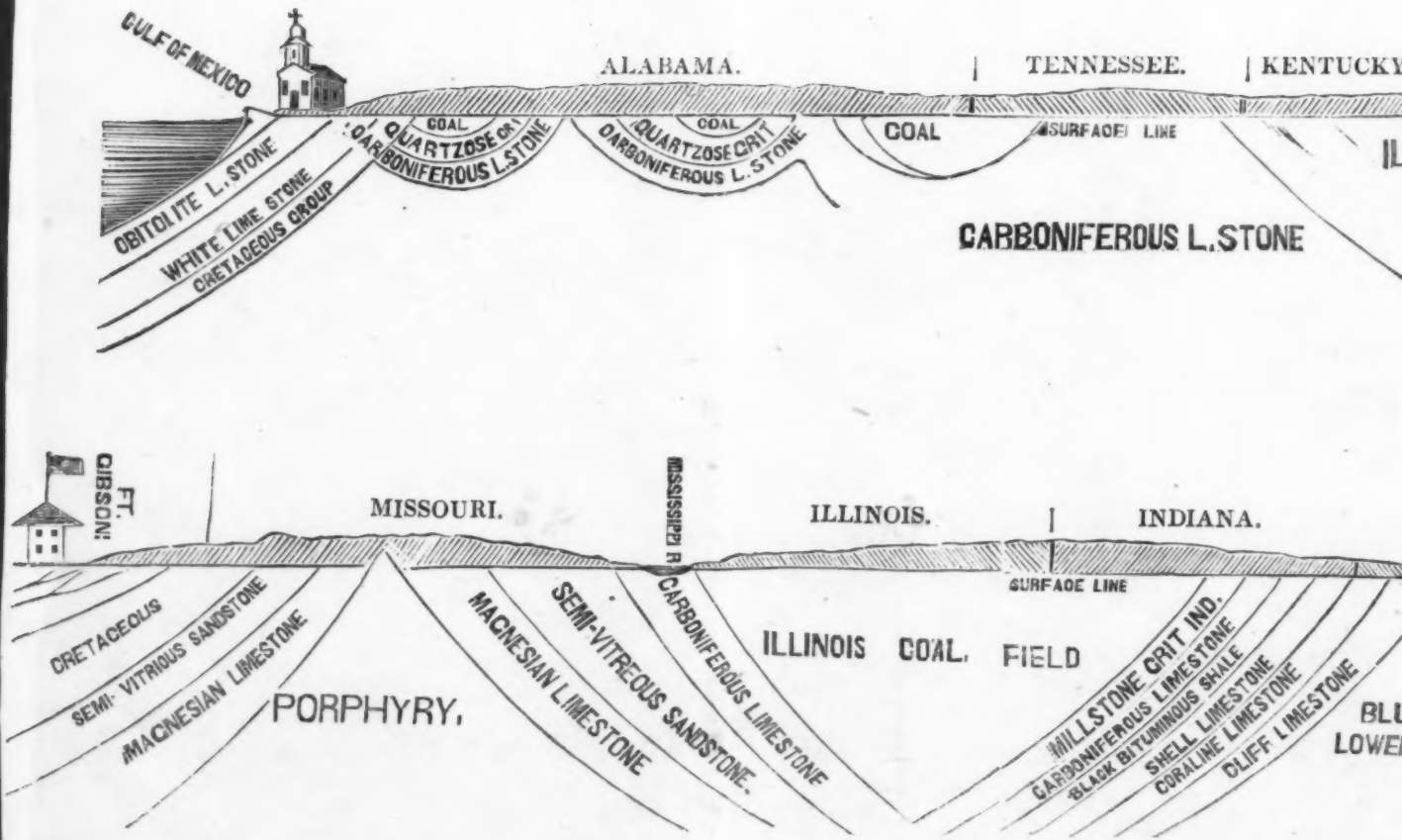
§Owen's Report.

limestone on the Wisconsin river. If their identity should be established, it will prove an important fact to the interests of the mining district of Iowa and Wisconsin, as it will hold out the prospect of finding the lead ore, and other minerals below the blue limestone, in which the veins become defective, or entirely give out. Penetrating through the magnesian limestone, and the sandstone which covers it, we find on the head waters of the White, the Big Black and the St. Francis rivers, Plutonic, Metamorphic and Volcanic rocks. The syenite covers entire districts, and the porphyry is found forming in one or two places a connected chain in the hills. The magnesian limestone is found at one or two points on the Currant river, surrounding the porphyry without seeming to have been disturbed by an elevating force. But at other points there are evidences of volcanic agency in the dislocation of the strata, and the occasional appearance of dykes. The Iron Mountain and the Pilot Knob seem to have been raised by igneous action, operating after the deposition of the limestone and sandstone formations, for near the line of junction, the strata of one has been converted into marble, and that of the other into compact quartz.

The geological character of the State of Arkansas is not fully known. Its eastern portion is covered over by alluvium, which, perhaps, reposed upon the green marls and sands which underlay the alluvial bottoms of the Mississippi river, to the mouth of the Ohio. Its western portion abounds in formations similar to those which characterize southern Missouri. Towards the Washita Hills the sandstone becomes more compact and ferruginous. The Plutonic and Volcanic rocks abound in its south-western division, and are flanked by strata of what Mr. Featherstonhaugh calls Grauwacke—an old deposit in which geologists have for the last half century concealed their ignorance. This ferruginous sandstone is classed by him as the old red sandstone, or the Devonion; but being below the Silurian rocks, it is probably an equivalent of the Potsdam sandstone. The mountainous parts of Arkansas, and the territory immediately west of it, are surrounded on the south and south-west by the cretaceous group.

In this sketch of the geology of the Mississippi Valley, we have been compelled to resort, in a few instances, to generalizations, without having space to assign the data on which they are based. The views which we have presented, we believe, will be found, however, in the main to be correct. In our next number we will endeavor to present a sketch of the economical geology of Missouri, or its mineral resources.

In the ideal sections represented in the wood cuts, we have attempted to show the relative position of the strata forming the great basin of the Mississippi. One is from Lake Pekin to the Appalachicola Bay; the other from the Appalachian coal measure, to Fort Gibson, on the Arkansas river. In these wood cuts no regard has been paid to the relative distances of different points, the object being merely to present the relative succession of the strata above the surface line.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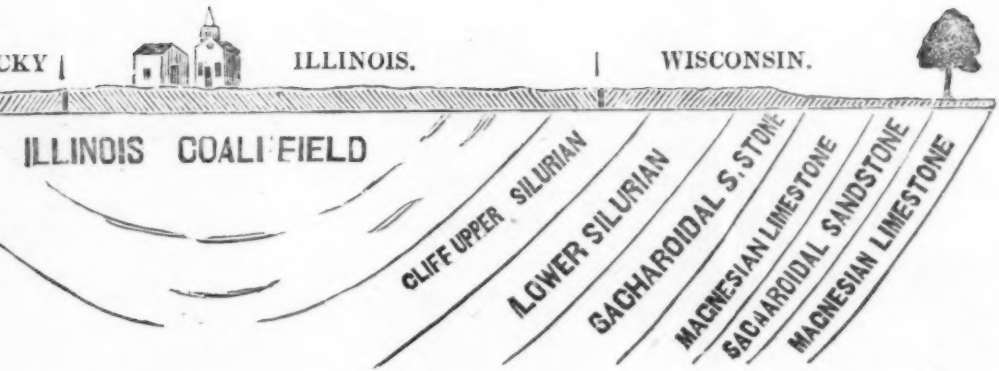
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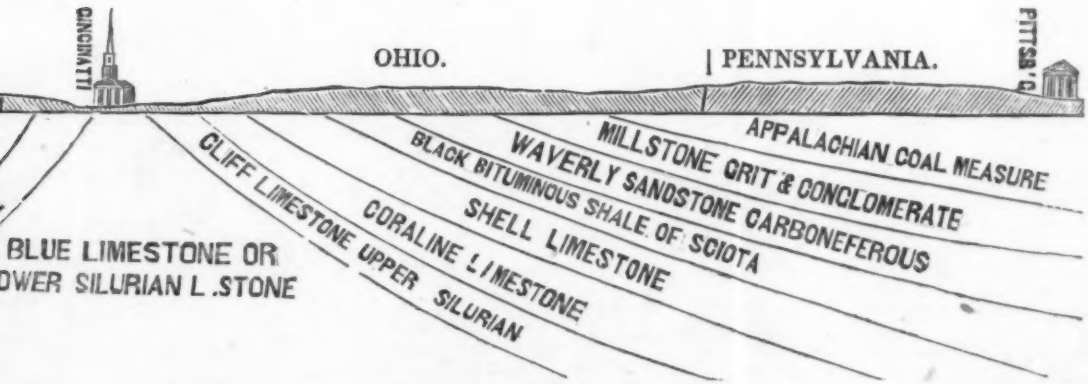
CINCINNATI
OHIO.
| PENNSYLVANIA.
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APPALACHIAN COAL MEASURE
MILLSTONE GRIT & CONGLOMERATE
WAVERLY SANDSTONE CARBONEFEROUS
BLACK BITUMINOUS SHALE OF SCIOTA
SHELL LIMESTONE
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ART. IV.—PUBLIC EDUCATION.

We publish below an extract from a letter, dated December the 8th, 1845, written by Evans Casselberry, Esq., of St. Louis, to the Hon A. O. Forshey, a member of the convention, which was at that time in session in Jefferson City, for the purpose of framing a new constitution for Missouri. It was originally intended as a mere private letter, but Mr. Forshey, deeming its contents of public importance, had it read to the convention from the clerk's table, and the convention approved of its sentiments, and ingrafted the principle laid down in the letter, into the sixth article of the new constitution, which it would seem was the most popular part of that instrument. We copy from the letter as published in the newspaper "Jefferson Inquirer" of Feb. 25, 1846.

"My object in this letter is to make a few suggestions, showing, in as few words as possible, the many *pecuniary* advantages that would accrue to the people from a general system of common school education, maintained at the expense of the public. The advantages to the people of such a system of education would, in my opinion, be incalculable.

"A system of universal and sound education would increase the wealth of our State by its effects on our legislature. Some laws give health and strength and growth to a community; while others disorder, enfeeble and dwarf it. If unwise, they bind it hand and foot, and cripple its energies; if wise, they give force and direction to its powers, and impel it on to prosperity. 'I cannot play,' was the noble answer of the Grecian statesman to one who handed him a musical instrument. 'I cannot play, but I can make a small State a great one.' He knew the powers of his intellect, and understood the efficacy of those laws and regulations which his genius enabled him to devise. Of the extent to which even one act of the legislature may increase the resources of a country and advance its prosperity, we have a recent and signal instance. By a single resolution, a few years since, the State of New York gave to her citizens the wealth of an empire. By her bold and far-sighted policy she created, in her bosom, treasures greater than are contained in the mines of Potosi in South America. Hundreds of years of ordinary progressive prosperity would not have advanced her to the situation she now holds, in consequence of a solitary enactment. In a few years she will possess within herself more wealth, population and power, than could have been found, fifty years ago, in all the States of this wide confederacy. A single unwise law, on the other hand, may, for a time bankrupt a State.

"Let us consider the effect of universal and sound education on legislation. In a free country good laws can only be the result of general intelligence among the people. For such are not the offspring of chance, but wisdom. Bacon, the greatest philosopher that ever lived, and one of the greatest statesmen, has told us that good laws are 'deep not vulgar, not made on the spur of a particular occasion, but out of providence for the future.' Laws of this kind can never be

enacted but by wise men. And to secure wise men as their representatives, the people must be intelligent.

"Further, if a whole community were well educated, there would be a probability of obtaining good legislators, much greater than now exists, as there would then be a much greater mass of intelligent men capable of discharging the duty of legislation. Out of thousands of educated men, it would be easy to select those who would be competent, from their talents and qualifications, to take large and remote views of all the interests of the State, and thus secure its prosperity.

"Laws, also, are the emanations of the intellect of a community in another sense, besides their being framed by those whom the community appoints; for few legislators will ever favor a law which they cannot justify in the eyes of their constituents. And if we had the wisest legislators that ever assembled, their wisdom would avail as little, if the people were ignorant and prejudiced. We would verify, in our case, the truth of the biting remark which Anacharsis made to the Athenian lawgiver, on that part of his code by which a small and choice body of counsellers was appointed to deliberate and prepare business on which the assembly of the people was to act. 'Solon,' said the caustic Scythian, 'You have wise men to deliberate, and fools to decide.' If a people are governed by superficial appearances and appeals to their prejudices and passions—if they have not intelligence sufficient to appreciate the solid reasons on which all salutary and far-reaching enactments are based—that people must be content with laws the reverse of those which Bacon applauds; their laws must be vulgar not deep, made on the spur of the occasion and not out of providence for the future.

"If, then, the history both of our own and former ages teaches us that nations are often ground to the earth by bad legislation, while they are even ignorant of the cause of their distress, and so can do nothing to remove it; and if we are taught that a wise and provident legislation often opens sources of wealth through which millions annually flow into community, I appeal to every reasonable man, whether that diffusion of intelligence which would secure our posterity from the curse of ignorant legislators, and ensure to them the services of enlightened men, would not be cheaply purchased with a sum ten thousand times greater than that which a general system of common school education would cost.

"Universal education would promote the wealth of a community by improving the capacity of all its members, and thus enabling each individual to apply his powers to the best advantage. The ox and the horse excel human beings in strength; why is it then, that the labor of a man is of more value than the labor of a beast? It is because he possesses intellect. The more, then, of this distinguishing and superior quality any one can be made to possess, the more valuable, in general, does his labor become. Probably no man will dispute the truth of the inspired proverb, 'wisdom is better than strength.' A fine illustration of the gain to national wealth as well as to national character, from the superior powers a good education imparts to laborers, is furnished in some of our eastern manu-

factures. There are a number of articles for the manufacture of which the British enjoy at least equal advantages with ourselves; yet such is the superiority of our workmanship, owing solely to the higher skill and ingenuity which intelligence imparts to the American workmen in these branches, that the foreigners are obliged to counterfeit the stamp of our manufactures to prevent their goods from being driven out of the market. This is a fact well known to our eastern merchants. Some time since an agent from Birmingham was sent to our country for the express purpose of inspecting a particular manufactory, to ascertain the cause of this superiority, that the improvements in machinery, to which it was ascribed, might be examined and introduced into the establishment in which he was employed in England. He entered the building during an intermission of labor, and found many of the hands engaged in reading. He expressed himself to his conductor as satisfied at once as to the cause of the superiority of the American manufacturers. 'It lies,' said he, 'in the superior intelligence of the workmen; each one of them is fit to be a superintendent.'

"I would appeal to every observing man, whether the advantages of a good education would not be worth to every man, and every woman in a pecuniary point of view in the course of a lifetime, more than many thousand times the benefit he or she would derive from the money it would cost, expended in any other way.

"I know, indeed, that, in monarchial and aristocratical States it has been a favorite opinion that education spoils common laborers—that it puts them above their work. But 'knowledge puffeth up' only where it is a distinction. In countries where common laborers are kept in gross and debasing ignorance, and are regarded and treated as little better than beasts, education will naturally unfit an individual for labor—he has had imparted to him too much dignity of character and self-respect to fit him for a state of servile degradation. But let education be made common, and the laboring class treated as intelligent beings, and no man will be above work. Manual labor is made honorable by the respectability of those who perform it; for the character of every occupation is given to it by the character of those who pursue it. It is an insult to the God of Nature, to suppose that one class of mankind must *necessarily* remain degraded in order that another may be made comfortable.

"Education would increase the riches of a community by facilitating the adoption of all improvements in the mechanical, manufacturing and agricultural arts. There are two strong barriers which obstruct the advancement of uneducated people—ignorance and prejudice. Men who never read, know of no other improvements and methods of work than those which they have seen. Thus we observe hundreds of labor-saving or economical inventions in use in our country, which in another, are totally unknown. And even in the same country, the improvements common in one section are unheard of in another. But if men read, this would not be the case. Every man might be thoroughly acquainted with his calling; he could not only know it as he was taught it, but as it is pur-

sued in other parts of the world; he could avail himself not only of his own and his immediate instructor's wisdom, but he could borrow the wisdom of all who have followed the same pursuit; he might receive valuable hints from men who had died before he was born; he might grow rich by availing himself of the discoveries of his antipodes. Publications on every branch of industry are procurable, cheap, and easily understood.

"But prejudice, as well as ignorance, treads in the paths of old, and it looks with scorn or suspicion on all improvements. And as it springs from erroneous views and contractions of mind, it can only be removed by that mental cultivation which will enlighten and expand the intellect.

"It might be invidious to produce domestic illustrations of these effects of ignorance and prejudice in retarding the accumulation of natural wealth; we will therefore draw them from our knowledge of other nations. The East Indians pack their cotton for exportation by machinery, and put into the same bulk three times as much as the Chinese, who pack by the hand. In consequence of their ignorance, the freight of the Chinese cotton costs them twelve times the price. The first saw mill ever erected in England was destroyed by the populace, who thought it would throw the sawyers out of employment. When Hargrave, less than a century ago, attempted to introduce the spinning-jenny, which he had invented, into the cotton manufacture, he was obliged to fly from Lancashire, at the risk of his life; such was the prejudice against the introduction of an improvement that has yielded millions upon millions to the wealth of mankind. Every year of commercial distress in England, witnesses an immense destruction of agricultural and manufacturing machinery. The ignorance and prejudiced laborers believe that the machinery, which is the real source of their wealth, is the cause of their distress. An engineer of deserved celebrity, not long since, stated that he had completed several machines of great utility, but dared not bring them forward on account of the popular feeling.

"We have no means of accurately estimating the pecuniary loss which such a feeling inflicts on society; but we can easily see that it is immense. The cost of a general system of common school education, would be as dust in the balance when weighed against the comfort and wealth produced by the improvements, which increased knowledge would introduce.

"The original inventions and discoveries, which would naturally result from the cultivation of all the minds in the community, would open new and copious sources of wealth. Men celebrated in the history of the arts have been frequently poor, but I remember only a solitary instance of one who was uneducated. Some have been found who have educated themselves, in spite of unfavorable circumstances; but cases of this kind must necessarily be rare. It requires the possession of knowledge and previous mental discipline to fit men for inventing and discovering. The number, therefore, of those felicitous combinations of thought, which originate useful improvements in the arts of life, in any country,

will generally be found proportional to the number of its educated inhabitants. If only the fifth part of any community are enlightened by early instruction, we can calculate on but the fifth part of the useful inventions and discoveries which might be gained by the education of the whole. And thus we see that the nations and States most distinguished for general intelligence, are also most conspicuous for the number and usefulness of their labor-saving machines, and for their continued succession of novel and successful experiments in the various branches of industry by which wealth may be accumulated. To verify the truth of these remarks, compare England with France, and our western States with other portions of the Union. But not one thirtieth of our fellow citizens receive as good an education as all might receive by means of a general system of education. And what a change would be wrought upon the condition of a community, were the practical inventions and discoveries of its members multiplied thirty-fold! With what an accumulating rapidity would its prosperity move onward! What multitudes would then benefit society by their ingenuity, who now curse it by their vices! How many Franklins, Fultons, Rittenhouses and Whitneys would rise up and bless the world, if the beams of knowledge were poured upon every mind, to kindle the flame of slumbering genius! The sudden greatness of Missouri would resemble the poet's description of the fabled goddess, whose creeping form instantly expanded by its own motion, until as she walked upon the earth, her head was hidden in the clouds.

"The invention of a single intellect, which might have slept in ignorance, had it not been awakened and called into activity by this all-reaching influence, might produce an annual pecuniary revenue, which would far more than defray the expenses of the system to which its powers owed their development. It is to the increase of these very inventions and discoveries, that the moderns owe their superiority, in arts and riches, over the ancients; and by availing themselves of these, one nation now excels another. To illustrate this truth, let us compare the commercial and manufacturing power employed in England, with that of France. We learn from the statistics of Baron Dupin, that the force of men and horses engaged in manufacturing and commercial industry in France, is equal to the power of 6,303,019 men. While in England and Scotland the animate force thus engaged is only equal to the power of 6,014,893 men. Thus we see France would be a greater commercial and manufacturing nation than England, were the amount of labor in these two nations dependant on the respective quanities of animate power they had in service. But the knowledge and ingenuity of the English have brought into existence so many wonderful machines and contrivances for economizing and accumulating power, that their whole force of living beings and machinery engaged in commerce and manufacturing, is equivalent to the power of 24,854,893 men; all the machinery and natural agents the French have brought to their assistance, only raise their force to a power equivalent to that of 11,536,352 men. Thus the English have quadrupled their power by

machines, while the French have not quite doubled theirs. In other words, in England, owing to the superior discoveries and inventions of its inhabitants, every man occupied in commerce or manufactures, is, on a average, able to accomplish as much as 2½ Frenchmen.

"Is it now any wonder that these Islanders, with a narrow territory, smaller population, and less genial climate, so immensely outstrip their less intelligent and ingenious neighbors, in the accumulation of wealth? And can we conceive a stronger proof of the actual pecuniary gain which accrues to a nation from cultivating the intellect of her sons, than is furnished by such a fact.

"The profit arising to a community from a single invention of one of its intelligent members, often yields a far greater annual amount than could possibly be derived, from any other method of applying the money which a general system of education would cost. This can be proved by scores of facts. We will mention but one or two. The ingenuity of Hugh Middleton, some hundred years ago devised and executed a scheme for supplying London with pure water. It is estimated that the amount now used in the city would cost, if furnished by hauling, the sum of nine millions of pound sterling, per annum. By the work of Middleton, it costs but about three hundred and eighty thousand pounds sterling. Thus a single felicitous invention has annually saved to one city, upwards of eight millions and half pounds sterling, or nearly forty millions of dollars.

"I will only refer in further illustration of this principle, to the effect of the application of steam to the propulsion of boats, by Fulton—a discovery with the results of which you are familiar—a discovery which has already done more for every State in the Mississippi Valley, than all the power of industry working by the old methods, could have affected for it in a hundred years. It has filled our houses with the productions of every country and climate, and has raised the price of very acre of our land, and almost every article of our produce. If the education of all the children of this State (Missouri) for centuries, raised up only one such discoverer as Fulton, the principal inventor of the method of applying steam power to boats, or James Watt, the principal inventor of the steam engine, or Arkwright, the inventor of the spinning-jenny, or Whitney, the inventor of the cotton gin, without yielding another advantage, the State would be immensely a gainer by the outlay.

"No man but one who has examined the history of nations, and investigated the causes of their poverty and wealth, can estimate the value of knowledge to a country's prosperity. The God of Nature has filled the earth, the air and the water with treasures—with a bountiful hand he has scattered wealth through every land; and nothing but ignorance and its consequent laziness, stupidity and vice, prevent nations from abounding in everything that can make the condition of man comfortable and glorious. The victories of Agincourt, Blenheim, Trafalgar and Waterloo, have not yielded to England the amount of glory she has gained from the labors of her Bacon, her Newton, her Locke and her Milton;

and France will boast of her Paschal, her Des Cartes, her LaPlace, and her Corneille, when the bloody throng of her triumphant marshals shall be forgotten.

"I imagine that I have said enough to convince you, and all other candid and intelligent men, that the actual *pecuniary* advantages to the people of Missouri, arising from a general system of common school education, would be beyond computation."

ART. V.—STEAM NAVIGATION TO CHINA.

We are indebted to the "Southern Literary Messenger" for the following interesting article, from the pen of Lieut. Maury. The favorable situation and literary pursuits of the author, are calculated to give the highest degree of credit to his facts; while the bold and comprehensive range of his genius, imparts an unusual interest to all his public communications.

The facts contained in the following article, lead us to doubt the practicability of establishing a convenient and reliable commercial route to China, across any part of the Isthmus which divides the Gulf of Mexico and the Caribbean Sea from the Pacific Ocean.

The objections to this route are calculated to afford a strong argument in favor of a rail road across the continent; but as to the practicability of the latter project, we give no opinion. We are persuaded, however, that if such a road were in existence, it could not, in cheapness of transportation, compete with the present route to China; and that its advantages, in a commercial point of view, would be unequal to the vast expense attending its construction and repairs—although in a national point of view we esteem such a work as highly important and meritorious.

Without some extraordinary means of social intercourse between the people of the two sides of the Rocky Mountains—such as can only be afforded by a rail road—it is unreasonable to expect that they will long continue under the same government. Trading as they do to opposite parts of the globe, and cut off from personal intercourse by the vast desert which intervenes, the inhabitants of the west will cease to sympathize with their brethren of the east; and lacking this, the strongest of all social bonds, they will doubtless, in time, establish a government of their own; and it would be unnatural in the people of the east to resist such a policy.

By reference to an article on "The Natural Laws of Commerce," published in the last number of the Western Journal, the reader will perceive that we do not regard Asiatic commerce as possessing that high degree of importance which is generally attached to it by the people of this country.

We have frequently heard it said that the commerce of the east has enriched

every nation which has been so fortunate as to monopolize it. This commerce may have enriched cities and companies; but it is not of its nature to enrich a nation. It brings nothing that adds to the permanent wealth of a country, and but little which contributes to the substantial comforts of the people; while it has a constant tendency to drain the country of the precious metals. But were a single city in Europe or America to *monopolize* the Asiatic trade, it would be a certain source of wealth to that city, for the reason that the dealers in this commerce would have it in their power to sell at almost unlimited profits; but if those profits were paid by the people of that country in which the city was located, it is difficult to conceive how the country could grow rich by the operation.

Addressed to the Hon. T. Butler King.

NATIONAL OBSERVATORY, WASHINGTON, *January 10th*, 1848.

My Dear Sir:—Yours of the 21st December, 1847, in reply to mine of the day previous, has been received. As it is the text for what is to follow, I take the liberty of quoting it:

"I am greatly indebted for your note of yesterday, this moment received. It discloses the remarkable fact, that in establishing the line of steamers from Panama to Oregon, we have actually taken a step of three thousand miles on our way to China! That California must afford the point of departure for our line of steamers to Changhai, which must consequently become our commercial and naval depot on the Pacific! Why should it not also become the rendezvous for our whale ships, instead of the Sandwich Islands, and the terminus of the great railway to connect the Atlantic and the Pacific? This great circle route from the shores of the Pacific to those of China, may justly be regarded in the light of an important discovery made by you—no other persons ever having suggested it—I must, therefore, beg the favor of you to give me your views respecting it, and the suggestions above more in detail—and also of the Gulf Stream to which you allude. Most truly yours, (Signed,) T. BUTLER KING."

With regard to a current of warm water across the North Pacific to the Northwest Coast, from the shores of Asia, and corresponding to the Gulf Stream in the North Atlantic, I know but little more than what was stated by me in a paper on the Currents of the Ocean, read before the National Institute in 1844, and published in the Southern Literary Messenger, for July of that year.

I beg leave to refer you to that paper, with the remark that all that I have since learned, tends to confirm the views there taken with regard to such a current. Should it be found really to exist, it will exercise great influence upon the course of navigation, and consequently upon the commerce of that Ocean.

Thanks to the enlarged views of the statesman at the head of the Navy Department, I am enabled to carry out a favorite project, long entertained, of preparing from the log-books of our men-of-war and merchantmen, a chart which shall show the prevailing winds and currents in all parts of the Atlantic and Pacific Oceans.

The plan is to lay down on this chart the tracks of several thousand navigators, in such a manner as to show at a glance, the winds and currents encountered every day by each.

Lieutenant Whiting and other officers have been detailed for the purpose of assisting me in this undertaking. The sheets of the North Atlantic, prepared by that officer, and already published, have, by the importance of their results, attracted the attention of navigators, and given the undertaking renewed impulse.

With a liberality worthy the enterprise of American ship owners, and in a manner characteristic of the intelligence of American navigators, the most active co-operation has been promptly and freely granted; so that in the course of this year, I expect to have the voluntary, but effective co-operation of several hundred merchant vessels, making daily, in all parts of the sea, and on their passages to and fro, the requisite observations for this purpose.

When the facts and materials thus collected shall be brought together, spread out upon the chart and discussed, we shall then know certainly as to this Gulf Stream, and be enabled to form correct ideas as to the prevailing winds and currents in all parts of that broad ocean—a desideratum of great importance.

In the various projects which have, from time to time, been proposed for reaching China, partly by railroad or canal across the Isthmus of Darien, or other parts of the continent, it does not appear that the great circle route across the ocean, has ever been considered If we examine the course and distance from Panama to Changhai, as they appear on Mercator's chart—which is the projection used in navigation—we shall find the distance to be about 9,500 miles, and the course to be by way of the Sandwich Islands, which are midway this route. But on this chart, as on all others, the surface of the earth, which is a sphere, is represented as a plane, and is therefore distorted. The shortest distance, then, between any two places, unless they both be on the Equator, or on the same meridian, is not the straight line on the chart which joins them, but it is along the arc of the great circle in the plane of which they are situated;—and this arc, when projected on the chart, will appear as a curved line.

Now, if we take a common terrestial globe, and draw a string tightly across it from Panama to Changhai, it will show the shortest distance between the two places, and will represent the great circle route between them. And this string, so far from touching the Sandwich Islands, will pass up through the Gulf of Mexico, thence through Louisiana towards Oregon, crossing the ocean several thousand miles to the north of them. The distance from Panama to Changhai, by this route, were it practicable to travel it, is 8,200 miles, or about 1,200 miles less than it is by the way of the Sandwich Islands.

Now, to those who are accustomed to form ideas of bearings and distance from maps and charts, and not from *globes*, this statement may appear startling: yet it is nevertheless true, that a person standing at New Orleans, is about 3,000 miles nearer to China, than he is when he starts from Panama by the way of the

Sandwich Islands—notwithstanding he will have traveled at least 1,500 miles to reach Panama. But the great circle from Panama through the Gulf and Louisiana, to China, as a *traveling* route, is impracticable, and the next step, therefore, is to find a route which is practicable, and which shall deviate from this as little as headlands or other obstacles to navigation will admit. When we have found such a route, we can examine the advantages which it offers—compare them with other routes that have been proposed, and then form conclusions.

By still holding one end of the string at Changhai, on the globe, and carrying the end that is on this side, out into the Pacific, until the string will just clear the Peninsula of California, we shall have an arc of a great circle along which a steamer, with fuel sufficient, might sail all the way from Chili to the islands of Japan without ever having to turn aside for the land.

This, therefore, is the shortest route, and the nearest *navigable* distance to China for all vessels, whether from Chili, Bolivia, Peru, Equador, Central America, or the Pacific ports of Mexico. In point of distance, *it is the great highway from America to the Indies*, and will, hereafter, be called the great *commercial* circle of the Pacific Ocean.

After running along this route and passing Cape St. Lucas and Bartholomew, if we look to the right we shall find, at the distance of a few leagues, the beautiful ports of Upper California, including the safe and commodious harbors of San Diego, Monterey and San Francisco. These ports are right on the wayside of this great circle and commercial highway. They occupy that geographical position, and present, in the future, those commercial advantages which will assuredly make the most favored of them the great half-way house between China and all parts of Pacific America.

The harbor of Monterey is said to resemble the beautiful Bay of Naples. It has water and capacity for the combined navies and ships of the world. The winds here never blow *home*, and the anchorage, therefore, is perfectly safe.

Merely as sheets of water, however, both San Diego and Francisco, are, in the eyes of the sailor, still more beautiful; but San Diego is on the verge of a sterile country, while San Francisco is further out of the way of the great circle route than either of the other two.

My enterprising friend Wheelwright, has a monthly line of steamers from Valparaiso, touching at the "Intermedias," Callao, and Guayaquil, to Panama. Under your bill of the last session, and by the energy of the Navy Department in giving it effect, Aspinwall & Co., of New York, have the contract for another monthly line of steamers from Panama to the mouth of the Columbia river. This line, no doubt, will connect at Panama with Wheelright's, and with one or more lines on this side to Chagres. The steamers of Aspinwall's line are to touch at Monterey; and Monterey is, therefore, the port for the terminus of the China line.

It is in latitude 36 deg., 38 min., and is one-third of the distance, and directly

on the wayside from Panama to China; and from Monterey by the great circle to Japan is not nearly so far as it is from Panama, by the compass, to the Sandwich Islands—the latter is 4,500 miles, the former 3,700, or just the distance from Charleston to Liverpool.

There is no stopping place—no land—between Panama and the Sandwich Islands; and in the present stage of steam navigation, no steamer can carry fuel for 4,500 miles at a stretch, and pay owners.

Midway between Monterey and Changhai, and immediately on the wayside, are the Fox or Elcoutian Islands, where the Monterey line can have its depot of coal. It is just about the distance both from Monterey and Changhai to those Islands, that it is from Liverpool to Halifax, where the Cunard line has its depot. Though the lines from New York to Liverpool, Havre and Bremen, have proved that 3,000 miles are not beyond the fuel limits of steamers.

By examining the chart or a globe you will see that this route from Monterey lies wholly without the limits of the north-east trade-winds; and therefore so much the better for steamers. Though little or nothing is known of this part of the ocean, except to the enterprising whale-men of New England, yet reasoning from what we know as to the prevailing winds between the same parallels in the North Atlantic, I suppose that this route, under certain circumstances, will also be found the best for sailing vessels. But the "wind and current chart" which is in the course of preparation, will determine this point.

Before the navigation of the North Atlantic was as well understood as it is at present, and, indeed, the practice is scarcely wholly abandoned at this day, it was customary for vessels trading between this country and Europe to run down to the south many hundred miles out of their way, in order to get the north-east trades. This was done with the expectation of more favorable winds and a quicker passage; but experience has proved the contrary, and there are but few navigators now, who, unless they are bound to the West Indies, pursue the "southern route" across the Atlantic. The old practice in the Atlantic, however, still obtains in the Pacific. The Sandwich Islands are within the trade-wind region, and all vessels bound westerly across the North Pacific, are in the habit of getting into the trades and making those Islands.

The New York packet ships in their trips to Liverpool average 130 miles a day. Where the trade-winds blow, a vessel will average about 150 miles a day. From Changhai to Monterey, by the great circle, a vessel would be for much of the way between the same parallels of latitude that she would be from New York to Liverpool. The prevailing winds are probably the same for each ocean; this, however, is conjecture, but like causes produce like effects the world over; and those physical conditions which make the west winds blow across the North Atlantic require them to blow, at least with equal prevalence, across the North Pacific. The latter is a more open sea and a wider ocean: there is less land in it to interfere with the prevalence of winds, to intercept them, to change their direc-

tion, or modify their force, and therefore we may suppose that the prevailing winds of the North Pacific are more uniform than they are in the Atlantic. But supposing them equal, one of the New York packets at her average outward bound rate of sailing, would make the passage by the Great Circle from Changhai to Monterey in forty-one days, which is about equal to the passage from Rio to the United States.

If we suppose the same ratio to hold in the Pacific, which obtains between the outward and the homeward passage across the Atlantic, then the average sailing distance the other way, that is from Monterey to Changhai, would be fifty-seven days by the Great Circle. The trades are favorable for the outward bound trips of sailing vessels from Monterey, and therefore the old sailor adage: "the longest way round is the shortest way home," will probably continue to hold good for that half of the voyage.

But you have asked me to consider the best route not for sailing vessels, but for a line of steamers.

The Great Circle is the route for steamers both ways—and supposing the vessels upon the proposed line to be equal in speed to the "Great Western" in her palmy days—and why should they not be superior?—they will make the passage to and fro between Changhai and Monterey in twenty-six days, including the stoppage of a day for coaling at the Fox Islands.

It has been shown that Monterey is directly on the great highway from western South America and Mexico to China. This fact is of itself sufficient to show why the preference should be given to it as the American terminus of the line.

Intimately connected with this subject, however, is a rail road from the Atlantic to the Pacific.

A rail road from Savannah and Charleston to Memphis, has already been projected and is partly completed. From Memphis to Monterey, the distance by air line is 1,500 lines.

Supposing your proposed line of steamers established to China, and a rail road completed to Monterey, the productions and rich merchandize of China and Japan might be placed in the lap of the great Valley of the Mississippi in thirty days.

The intelligence brought by each arrival would be instantly carried by telegraph, and as instantly delivered in New York and Boston. Hence the steamers would receive it on board, and in thirteen days more arrive with it in England; thence it would be taken across the channel in a few hours, and immediately communicated through the magnetic wires to all parts of the continent. And thus, by this route, intelligence might be conveyed from China through the United States to the people of St. Petersburg and Moscow, and perhaps, at no distant day, to Constantinople also, within forty-five days.

I see no reason why the rate of travel over the railroads, hereafter to be built in America, should not at least be equal to that of the English and European

railroads. I believe the usual rate in England to be about forty miles the hour. Over some roads it is more. But supposing the rate over the great Atlantic and Pacific railroad to be only twenty miles the hour, the time from Monterey to Memphis would occupy three days.

This route has further the advantage of being at once the most central and direct route that has ever been proposed from the United States to China.

The distance from Memphis by Monterey and the Great Circle, is only seven per cent. greater than it is by a "bee line" drawn through the air from Memphis direct to Changhai.

If you look to the long and much talked of canal across the Isthmus of Darien to Panama, you will find that a person from Memphis to China by that route would, on making Cape St. Lucas, the southern point of the Peninsula of California, be no nearer to Changhai, in point of distance, than he was the day he embarked at Memphis, notwithstanding that to reach Cape St. Lucas he would have traveled upwards of 4,000 miles; and if he should go by the way of the Sandwich Islands, he would, to reach China, have to perform a journey of 5,000 miles greater than would be required of him on this new route by railroad and Great Circle *via.* Monterey.

In the progressive spirit of the age, time has become to be reckoned as money; and if there were a canal already cut from Chagres to Panama, the circuity of the route and the loss of time compared with what is to be gained by the proposed line from Memphis and Monterey, would, in time, cause the abandonment of that, and the completion of this, so far at least as raw silk and other small parcels of merchandize for England, travelers, and the people of the United States are concerned.

The route across the Isthmus of Tehuantepec, though not so far out of the way as that by Panama, is nevertheless quite a round-about way; the distance to China being over 2,000 miles greater than it is from Memphis *via.* Mon-

Cortes caused a survey to be made of the Isthmus of Tehuantepec, with a view of uniting the two oceans. Afterwards, it became the favorite route which the Manilla merchants and others crossed over from Acapulco to the Gulf of Mexico.

Towards the latter part of the last century, an accidental circumstance gave it fresh importance. The Vice-Roy Boccareli, observing some brass pieces in or near the famous Castle of San Juan de Ulloa, with the stamp of Manilla foundry upon them, wished to know how they were brought to the Gulf. It was ascertained from the archives of the imperial city of Tehuantepec, that those heavy pieces had been transported from the Pacific to the Gulf, partly by land and partly by water across the Isthmus. The route from the Pacific being up the Chicapa across the rial-paso, thence by land over the grand Cordilleras to the head waters of the Coatzacoalcas, which empties into the Gulf. At what sacrifice of money,

time and men those pieces were transported, it is not stated—but it should be recollected that the feat was performed when the Spanish galleons from Acapulco were ballasted with silver, and laden with gold.

In 1814, the Spanish Cortes actually ordered the canal to be made: but this order produced no other result than a reconnoisance by Gen. Obregoso, which I have before me in the very excellent work of De Mofras, entitled "Exploration de Territorie de L' Oregon, Paris, 1844." Although the General's geodetic report was never completed, it gives, in the language of that intelligent writer, "very correct ideas of the nature of the ground and of the difficulties it presents."

I have also before me a MS. copy of the survey made three or four years ago by Cayctano Moro, in connexion with the grant by Santa Anna to Don Jose Garay, for connecting the two oceans by canal through this Isthmus. This MS. was obtained by Commander McKenzie, U. S. N., at Mina-tit-lan, from one of the assistants of the survey. It was copied by Lieutenant May, U. S. N., by order of Commodore Perry, and sent here, and is now in the hands of the engraver for publication.

With these, and other sources of information to guide me, I have attentively considered the practicability of a ship canal through the mountains of Tehauntepec.

From sea to sea, the distance across, in a north and south direction, between the parallels of 16 degrees and 18 degrees, is rather less than 120 miles. By Moro's MS., you can carry nine feet water one hundred and fifty miles up the Coatzacoalcas, though other authorities put the head of schooner navigation at the Island of Tacanachipa, which is only twenty-five miles from the Gulf.

But taking the most favorable view, which gives nine feet for fifty miles, and commencing the canal at the point proposed, which is about fifteen miles further up, at the confluence of the Maletengo, there remains a circuitous distance of seventy odd miles in which there is an ascent and descent of at least seven hundred feet to be overcome.

In this distance, the Sierra Madre is to be crossed; and I have never heard that there is to be found the famous Irish mountain, "with a bog on the top of it," affording water enough to feed a *ship* canal! The Mexican engineers, however, propose to bring it by two lateral cuts twenty or thirty miles from a mountain streamlet.

The canal to be a *bona fide* ship canal, should be at least seventeen feet deep, by eighty feet broad at the surface. It must be a copious stream, indeed, to supply water enough to lift up through 700 feet and safely to let down from this elevation again, the fleets of ships which we are told are daily to pass through such a canal.

Suppose the feeder to be ample, let any one who would form an idea as to the cost of a ship canal in the pestilential climate and inhospitable country of this Isthmus, recollect the expense of the Louisville canal, constructed with every thing at hand, in a healthy and settled country, around the falls of the Ohio—and

it is but as a rod in length, and only as a race for shallops in comparison with this. Let him recollect the difficulties, nay, practically, the impossibility of deepening the western rivers. We have not been able to increase the depth of the Mississippi itself, at low water, even so much as two feet, much less sixteen. What, think you, would have been the expense of digging out the Ohio river, from Wheeling to Pittsburgh, before that country was settled, so as to afford an uniform depth of seventeen feet at low water? Go into the calculation and examine the items: after that, you may be able to form something like an appropriate estimate as to the cost of a ship canal across this continent, in the most unhealthy region of the globe; a region in which native or acclimated laborers are not to be found, and where foreign laborers, knowing they should have to work knee-deep in mud and water, under a tropical sun, and in such a climate, could not be had for wages.

So impressed are the Mexicans themselves with the unhealthiness of the route, that Santa Anna, after granting to Garay this privilege, which he proclaimed to his countrymen, would make Mexico the focus of the world's commerce, the emporium of wealth and power, issued a decree directing judges to sentence malefactors to work on this canal, and then ordered a prison to be built on its banks to keep the laborers in.

But suppose the mines of Potosi to be exhausted and the canal to be made, I doubt much of its extensive use, for there are in the minds of sailors, great obstacles still in the way. It is well known that in that part of America, during the sickly season, even a few hours on shore are considered sometimes fatal, and always dangerous to unacclimated foreigners.

Two years ago, the United States Frigate, Savannah, cruizing in the Pacific, touched on the coast of Tehuantepec during the *healthy* season. Four of her crew deserted, and in two weeks three of the four were dead. She was followed by the Warren; seven of her crew deserted, one of whom in a very short time after, wasted and worn down with disease found his way back, and reported himself as the only surviving man of the party.

During any season, but especially the sickly season, which on this Isthmus is most of the year, a night in the "Black Hole of Calcutta" would be quite as inviting to travelers, as passage through this canal. I suppose that seamen would not ship to sail through it, at such seasons, on any terms. But if they would, there are other obstacles still in the back ground. Perhaps they are *the* obstacles; I allude now to the bars across the harbors, and to the dangers at either terminus of the canal. The bars are shifting bars, and therefore more difficult to remove.

The water and that at the mouth of the harbor, on the Gulf, is variously stated at from fourteen to twenty* feet, while the outlet at the other end, is obstructed by the bars both of Teresa and Francisco. As often as vessels, on

*The highest ever known.

approaching the mouth of the Coatzacoalcas from the Gulf should be caught in a norther,—and hurricanes prevail here for much of the year,—there would be danger, if not wreck. The ship would be embayed, close on a lee shore, from which there is no escape: there is no harbor nor shelter to the south of Vera Cruz, that a vessel at such times could make. During a norther the sea breaks "feather white" across this bar, and where the sea breaks in a gale, no ship can live. With such an exposure to the swell from the north, as this bar presents, to prevent the rollers from breaking over, it would require a depth twice, if not thrice as great as it now has.

There are the bars at the mouth of the Mississippi river, choking up the commerce of that great valley, checking if not damping, the prosperity of the whole country; and yet the labor and cost of deepening them even so much as *two* feet more, are such that the enterprise of the nation has not yet found itself equal to the task.

Look at the coast line about the mouth of the Coatzacoalcas. This port is in the middle of the crescent formed between the peninsula of Yucatan and the coast below Tampico—now you will observe, that if a vessel were caught in a *norther* off the bar of the Coatzacoalcas, she could not make any course that would take her clear of the shore. She is now in a *cul de sac;* and there is no escape for her.

On the Pacific side it is worse. The bars there have not so much water in them, and the outer one is exposed to the full force of the waves that come across that broad ocean. Here, the sea is visited by the most violent storms, accompanied with thunder and lightning, that are described by sailors as truly awful. In short, such are the dangers and difficulties of navigation in that region, that there is an admiralty order, forbidding British ships of war to visit it between June and November.

There are also the Nicaragua and three or four other routes, that have occupied, more or less, the attention of nations and capitalists, from time to time; but the difficulties and objections with regard to them are quite as serious as those which I have been considering with regard to Tehuantepec and Panama.

But if the connection by any of the routes across Central America could be made at half the expense of Monterey, or of Wilkes' or Whitney's rail road, I should consider either of the last three of far greater importance in a national point of view to this country, and its people, than any route that can be projected to the south of us, free though it should be to them and to it.

To canals, railroads and all such improvements, there are attached two values; a *particular* and a *general* value, if I may so call them. By the particular value of a rail road or canal, I mean that value which attracts the capitalist, and which induces him to invest his money in it for the sake of dividends. It is simply that value which inures exclusively to the benefit of stockholders, and consists in the aggregate only of the nett proceeds of the work.

By the *general* value, I mean all the collateral advantages which such an improvement draws after it, and distributes through the country and to the people of the country through which it passes. These advantages are far greater than the other. They consist first, in the benefits of the original expenditure in making the new high-way, and the daily disbursements along it: afterwards, in using and keeping it in order, with a large train of numerous benefits to the working men who find profit or employment in consequence of its existence. These collateral advantages consist, too, in the increased value which the improvement, be it rail road or canal, gives to the land along it, and to the produce which is taken up on the way side and conveyed by it to market. Take an example: in consequence of the internal improvements which benefit New York, it is estimated that each house keeper in that city pays on the average $50 less a year for such little items even as eggs, milk and butter, than he did pay before these improvements were made, and than he would now pay were they destroyed. Each house keeper, therefore, in that city, who uses milk, butter and eggs, may be considered to have, on account of those items alone, a monied interest in these improvements sufficient to produce an annual dividend of $50, which is equal to six per cent. interest on a permanent investment of $833 33. The country dairymen, who supply these articles, are equally benefitted.

Were it possible to enumerate all the items under the head of general value of the canal and rail road in the State of New York, we should find millions of people who never invested a dollar in those improvements reaping large annual dividends from their general value. Destroy the great Erie Canal to-morrow and the worth of real estate and other property along it, which constitute but a part of its general value, would be depreciated by an amount exceeding many times the original cost of the work. Suppose, on the other hand, the whole region of rich country through which this canal passes were to be blighted in a day and made as barren as the deserts, and as pestilential as the coasts of Africa, leaving the canal only as a connecting link between the lake country and the sea. In this case what would be the general value of that canal in comparison to what it now is? It might still yield dividends and its particular value be good, but its general value would be merely nominal in comparison with what it now is.

A cut through the Isthmus would be the canal through the desert, and in comparison would bring to our country and her citizens but few general advantages.

But the rail road to Montery is the improvement through the rich country, and it would increase the value of lands, invite settlers, and benefit the public through innumerable sources under the head of general value, and strengthen the arms of the nation. A canal across the Isthmus would do no such thing.

There are annually employed in the Pacific three hundred American whaling vessels manned by twenty-five or thirty seamen each. These vessels have to break out their holds once or twice during the voyage to re-cooper, etc. For this and other purposes of necessity, they seek the ports of South America, of the

Sandwich and other islands in the Pacific. They are a hardy set of men who follow the whale in all parts of the ocean. It is a rule with them to visit port once or twice during the year to cooper, refresh and repair, for which several weeks are required; and I presume it is a moderate estimate to set down the average annual expenditure of each of these vessels whether in money or in kind on account of her crew and ship expenses of all kinds at $5,000—or one million and a half for the whole fleet.

The Sandwich Islands on account of the facilities they afford in the way of outfits, stores and repairs, are at present the principlal rendezvous for the vessels of this fleet. But were this rail road to Monterey completed, they would, as soon as that port should be able to furnish them with the necessary facilities, all resort there—and for the following reasons:

1st. They would be in immediate, direct and certain communication with owners and friends in Nantucket and elsewhere. 2nd. They would be relieved from the vexations, seizures, forfeitures, duties and port charges to which they are at present liable and often subjected. 3rd. They would be in their own free country under the protection of its righteous laws and glorious flag—and to their country they would assuredly come to expend for pleasure, outfits and refreshments, that million and a half of money which they now scatter yearly over the broad Pacific. Monterey is within their cruizing grounds, and is even now often visited by them. From this source arises one of those items under the head of general value connected with this rail road, which dollars and cents cannot wholly express—suppose the rail road to Monterey would induce the whalers to expend annually a million and a half of dollars in our own country and among our own people, which is now expended in foreign ports—$1,500,000 is six per cent interest upon a principal of 25,000,000, and if the improvment should realize this result, besides penetrating the rich country between Memphis and Monterey, and tapping many a source of wealth and prosperity that now lies hid on the way, it would prove equal to a funded investment of 25,000,000 by the nation in six per cent stock, the dividend from which would annually be expended among our own people instead of being taken from the circulation of the country, carried off and expended among the Islands of the Pacific as it now is.

Suppose the Mexican Canal should draw the whalers to Santa Teresa or Tehuantepec, the million and a half would go to the Mexicans and not "a los Yankees;" we should lose it.

The Sandwich Islands owe their commercial importance chiefly to the whalers and to circumstance connected with the fact of their being considered the half-way house between America and China. The star of their commercial prosperity has not yet reached its meridian height. Establish this line of steamers, and the day the decree is made for this rail road, that star will culminate.

This rail road would take the inland trade to Santa Fe and Mexico and increase it many fold. It is probable that several millions of Mexican people would use

this road as their commercial thoroughfare. For the extent of country to be supplied resolves itself into a question of dollars and cents. All those people who could get articles for less cost over it, than they would pay to receive the same over the rough roads from Vera Cruz and Tampico, would certainly use it.

There are other items of vast importance under the head of general value, some of which it may be proper to enumerate.

Memphis is the point of departure for this route; a city in the heart of the country and occupying a central position: it is situated right on the wayside of the great national highway and commercial thoroughfares between the north and the south, the east and the west. The Charleston rail road will connect with the Atlantic. The Mississippi river already connects it with the Gulf, and the lakes and thousands of square leagues of a rich and thriving country, through a ramified system of navigable tributaries, which if drawn out into one continuous stream, would more than encircle the entire globe. Growing out of these circumstances, the statesman will discover a general value containing items sufficient in consequence and importance to tempt nations into prodigality; for among these items, they would recognize the sovereign right to tax forever millions of property and people whose ability to pay is derived from the facilities afforded them to buy, sell and get gain.

Both Whitney's and Wilkes' roads to the Pacific have each its advantages, friends and advocates, and deservedly so. The country is wide and I do not start this in opposition to either of the two. Without the requisite topographical and geodetic information as to either of the routes that have been proposed from the valley of the west to the Pacific, I have been considering the most direct routes *geographically*, by which some central point of the country may be connected with China by rail road and steamers.

I did not select Whitney's as a link in this chain, because it is out of the way of the Great Circle route from Western America to China; because it lies within a colder region and would be liable to obstructions in winter, and because the harbor, at the mouth of the Columbia river, is not comparable to those in California. Lt. Howison was wrecked at the mouth of that river, two years ago in U. S. schooner, Shark. She went to pieces at a place on the bar where but a few years before the Exploring Expedition found water enough to float a 74. He chartered a vessel to take himself and crew to the Sandwich Islands, and though drawing but eight feet water, was detained sixty-three days just inside of the bar, and within one hours sale of the open sea, waiting to get out. I learn from that officer—and upon professional subjects there is not to be found better authority—that the character of that harbor has entirely changed since Captain Wilkes surveyed it. I did not select the route proposed by Wilkes from the Missouri, because it, too, is out of the way of the Great Circle, and also liable to obstruction in winter.

Nor did I select, nor have I advocated the route from Memphis as the very

best that is; I wish you to understand that I do not pretend to know any thing as to the nature of the ground or the obstacles in the way, further than what may be gathered from a mere geographical knowledge. San Diego and San Francisco may either offer a better terminus for the rail road than Monterey. Lt. Minor, U. S. N., who has been the governor of San Diego, informs me that he found bituminous coal in the Solidad valley, about six miles from the port. He found it on the surface and used it in the forge, though it was impregnated with sulphur.

Geographically speaking, however, Memphis and Monterey are the points. But geodetically, practically and commercially it may be better to improve the navigation of the Rio Grande so as to ascend it by steam boats some four or five hundred miles to the Paso del Norte, or even further up; then cross over the Sierra to the head of the Gila, thence down that shallow stream with locks and dams to its junction with the Colorado—and thence to San Diego and the ocean. But seeing that practically with us it is not so easy to make navigable those rivers in the west which are not so, I do not expect ever to see this route successfully pursued or even seriously advocated. Crossing the Mississippi midway between the gulf and the lakes the proposed route from Memphis would be through a healthy, and for the most part a fertile country. It never would be blocked up with snow—of all the routes ever proposed from the United States to China, it is the most direct for ths people of the States, the West Indies, Brazil, Bolivia, and all the intermediate country. The length of the rail road may be shortened several hundred miles for the present, at least, by starting it from the sources, or head of navigation, the Arkansas. The effects of a substantial rail road from Memphis to one of the ports of California, in connection with a line of steamers thence to China, would do much to break up old thoroughfares and channels of commerce through the Pacific, and to turn them through the United States. A good rail road with a moderate rate of tolls, but sufficient, nevertheless, to keep the road in repair, could be felt at the Sandwich Islands as a serious injury to them and their commercial importance.

Let such a rail road be given to the country, and after it shall have been for a little while in successful operation, you will hear no more said by the people on the Atlantic side in favor of a canal or rail road, across the Isthmus of the continent, for their convenience in communicating with China and "*Old East.*" So far from the people of the Atlantic wanting a highway there to get to the Pacific on their way to China, the people of the Pacific, at least of all Pacific America south of Mexico, will want to cut through the Isthmus of Panama to get to us on their way to China and the east.

The time from Panama up the Pacific coast to Monterey allowing the same rate at 220 to the steamer, would be 15 days and 3,300 miles. This part of the voyage would be tame to a degree, having scarcely variety enough to make applicable the travelers witticism, "sometimes we ship a sea, sometimes we see

a ship." Say, then, which of the two lines would a passenger, on arriving from Valparaiso, at Panama, or at Cuba from Brazil, or at Jamaica from England, be most likely to take, the one on this tedious route along the Mexican coast, with its dull monotony, or the one through the Gulf of Mexico, up the Mississippi and thence across the country by rail road to California?

Considering the present commercial condition of the Japan and Chinese empires, regarding the destiny of the Pacific States of the Union as one of glorious promise, taking the changes which are annually occurring not only in the articles of trade, but in the channels of commerce, and recollecting that of the eight hundred millions of people who are said to inhabit the earth, six hundred millions of them are to be found in the islands and countries which are washed by the Pacific, it is difficult to overrate the value and importance to the Republic, of a safe and ready means of communication through California with those people.

These six hundred millions have always been behind the two hundred millions of the Atlantic, in the art of ship building and in commercial enterprise.

Their junks and proaks were made only for creeping along the coward shores, not for venturing across the broad ocean. They are content that those white winged vessels which come from beyond the "black waters" should fetch and carry for them.

The Islander will cease to go naked—the China-man will give up his chopsticks, and the Asiatic Russian his train oil, the moment they shall find that they can exchange the productions of their climate and labor for that which is more pleasing to the taste or fancy. Hitherto the way to reach these people has been around the stormy capes, and the expense of carrying to the laboring classes, whose name there is legion, suitable articles of food and raiment, has been greater than they can bear.

Do you suppose the laboring classes of China would live and die on the unchanged diet of rice, if they could obtain meat and bread? This country will soon be offering from its western shores, not only those articles, but many other items of commerce, which, by constant and familiar intercourse with our people, they will soon learn to want and taught to buy. I regard the proposed rail road and line of steamers, as but an entering wedge—which, that these new channels of commerce may be safely opened, should be driven with energy.

The rail road must be a work of time—the line of steamers may be quickly started. I would, therefore, beg leave to call your attention to the importance of putting into simultaneous operation with the steamers, a mail to run in connection with them from Monterey to the most convenient point in the States.

This mail would not probably be oftener than once a month. If it come to Memphis or Little Rock, the direct route would be near Santa Fe and through Taos—supposing a grand pass should be found through the mountains, this mail would want an escort, and should be carried on horseback. On account of the Indians, etc., which beset this route, it might be well to establish a line of small

block houses, for the protection and safety of the emigrants to California. These stations could also afford horses, riders and escorts for the mail.

In that country, a journey on horseback once a month, of fifty miles in twelve hours—four miles an hour—would not be considered impracticable either for man or beast; with relays to accompany the riders, six miles an hour, or seventy-two miles in twelve hours would not be impracticable. But suppose the rate to be only fifty miles in twelve hours, or one hundred in the twenty-four, it would then be practicable—continuing the mail day and night—to reach Independence, Missouri, or Fort Gibson, Arkansas, from Monterey, in ten or twelve days, and thus letters from China might be delivered in New York, within forty-five days after date. It now takes more than twice that time.

When this mail route shall be established, the merchant in Boston, forty five or fifty days after his ship shall have sailed for China may send *via.* Monterey, fresh instructions, and they will reach consignees as soon the ship will.

Whether San Diego, Monterey or San Francisco shall be selected, as the terminus of the rail road and the line to China, will, or ought to depend partly upon the comparative facilities by which these ports may be reached from Memphis, and partly upon the advantages which they offer for the principal dock-yard hereafter to be established on the Pacific. The necessary surveys and examinations are wanting to decide this point.

The bills and reports submitted by you to the House of Representatives, in 1841, and subsequently, have caused you to be considered in the Navy, as the leader in Congress, upon the subject of ocean steamers, as connected with the naval defences of the country. In the policy of encouraging merchants to build for our lines of mail steamers, vessels that are convertible, at the pleasure of the government, into efficient men-of-war, is contained a principle of naval expansion, and the sinews of that maritime strength which, when rightly understood by the people, and properly carried out by the government, will make us, in war, the strongest power on the ocean, that the world ever saw.

This system of man-of-war built mail steamers, constructed with the aid of a trifling bounty from the government, and commanded by educated officers of the Navy, but manned and sailed on private account, will be to the Navy in war, precisely what the militia, led by West Point graduates, have proved themselves to the Army. Closely and intimately connected, is this great national rail road with that beautiful system of public defence.

Respectfully, &c.,

M. F. MAURY, *Lt. United States Navy.*

N. B. I send you a chart, with the routes marked off. The distances mentioned are in *nautical* miles.

Hon. T. Butler King,

Chairman of the Committee on Naval Affairs, House of Representatives, Washington.

ART. VI.—HISTORY AND HABITS OF THE POTATOE.

Owing to the arrangement of the matter for the present number of the Journal, we have no room for a discussion upon the interesting subject contained in the following article. The history of plants, (especially those of greatest importance,) like that of nations, runs back into fable; and hence, it is not wonderful that authors disagree. We are in search of truth, and if we fall into error, we esteem him our *friend*, who sets us aright. Those who are curious to know something of the value of the potatoe in its normal or wild state, and its particular location, will find some interesting facts in "Smee on the Potatoe Plant," a work which we recommend to the perusal of our readers.

Messrs. Editors:—We cannot agree on the habits and economy of the potatoe. The nature of this all-important plant should be fully understood. Its being a native of a tropical country gave rise to a popular error as to its economy, which was believed to conform to hot and dry climates; whereas, experience has conclusively shown that the very reverse of climate is most adapted to its nature. This led you, and thousands of others, to suppose that nature, in this case, committed an error in placing the potatoe where it did not naturally belong—while it is an established fact, that almost the whole arctic flora grows within the tropical latitudes of America, on account of the great elevation of its mountainous regions, some of which are covered with everlasting snow and ice. Peru, the native country of the potatoe, includes every climate on the globe, from the hottest to the coldest. What, then, does it signify that the potatoe is a tropical plant? I have proven that its habits conform to its place of nativity, and that Canada and the northern parts of Europe have, during summer, a similar temperature, like the elevated mountain ranges of middle America, which should plainly account for the thriftiness of the plant therein. Preston, who comes endorsed by the high authority of Alexander von Humboldt, as "the historian who has not now his equal living, neither in England nor Germany," has not given fancy sketches when he lets the potatoe spring up spontaneously in those cool regions, *where, however, winter is unknown*—there being no changes within tropical latitudes, which, with us, form winter and summer—there being a sameness of temperature the year round, as every geographer should know. The temperature of these elevated ranges, between eight and ten thousand feet, vary from thirty-five to sixty-five degrees Fahrenheit, where one crop of potatoes may follow the other without intermission of frost or winter. Preston further says, that the Peruvian Indians cultivated the potatoe next to the corn region of their mountains, from time immemorial before the conquest; that, therefore, it was not worse than a worthless weed, first discovered by the Europeans, but that it was a very important esculent to said Indians, from whom, no doubt, the Europeans learned its culture and use.

I have said, that if nature had placed the potatoe in the northern parts of

America, it would not have perpetuated its kind. Suppose a Mr. Smith has raised seed proper of the plant the same season, from seed under a hot-bed culture, does that prove that nature would do the same if left to chance? That under a natural course of vegetation it would at least require three years to mature tubers from seed, before they would re-produce the same, is a positive fact, of which every practical cultivator must be convinced. The following may serve as a test question:

Suppose the entire potatoe crop of this season, in North America, north of the 36° of latitude, were left ungathered next fall, and the land on which it grew turned out, and left to chance; does any body suppose that five years hence a single plant could be found within this entire region? I venture to say, not one! They might partially escape one or two winters, but never five in succession!

Now, gentlemen, all that you say in favor of potatoe seed, I fully endorse; but if farmers expect to raise full sized tubers from seed, before the second and third year, they will be undeceived by experience—which I have had for twenty-five years with the same. For my part, I have never been able, under the best culture, to raise a full grown potatoe from seed, before the third year.

E. MALLINCKRODT.

SCRAPS FROM THE EDITOR'S TABLE.

THE VERNAL SEASON.—It is the vernal season—and now, in obedience to Nature's voice, the vegetable world is bursting into life and beauty, while the husbandman, with strength renewed by the invigorating frosts of winter, is called forth again to the labors of the field. Would that I could escape from the stony street, and dull unchanging walls that obstruct my view, and, amidst ever varying rural scenes, unite my lot with his. But I hear him say: "Alas! my lot is hard—this doom of labor deprives me of my rest, and obstructs all earthly joy." Deem not so. Suppress the fatal thought, and accept with grateful heart the blessings which attend thy high estate. Thou wast not doomed to toil alone, for Nature was ordained thy help-meet. She is thy servant, and obedient to thy will—awaits thy high behests, and even now, as a bride robed in rich attire—decked with flowers and exhaling odors sweet—she welcomes thee to thy vernal labors. The minstrels of the air, from every grove, with song of sweetest note, greet thy coming; the insect tribe, with wing of every hue, disport about thy path, and in fairy mazes dancing, proclaim the happy season—while brutes of grosser natures modulate their hoarse voices to tones of love and joy.

It is the season of beauty—and of love, the source of all life. For every organic animated form, from the humblest plant to the highest intelligence, is conceived in love and nurtured by affection.

At such a season—amidst such demonstrations of joy and of homage to man who was commissioned from on high to subdue the earth—shall *he* alone be mute, and, in sullen mood, murmur at his lot? It is impious to repress the swelling tide of joy which springs from scenes like these. Then open thy heart and let flow in every stream of joy, until filled with gladness, it shall overflow with love and gratitude to the Author of thy being.

THE PORK TRADE OF THE WEST.

We are indebted to the *St. Louis Republican* for the following statistics and facts, in relation to the pork trade of the west. It is much to be desired, that some system of collecting and publishing facts in relation to this important interest should be established, which would enable the farmers to regulate in some degree, the number of hogs raised and fattened for market. Such information would tend to prevent the great fluctuations which so frequently occur in the price, and be alike beneficial to both the grower and the dealer. We should be pleased to publish all such facts, in relation to this branch of industry, as our agricultural friends may esteem beneficial to their interest.

Owing to the want of system in noting and collecting statistics in the west, perfect accuracy cannot be expected; but we imagine that the following tables are sufficiently accurate for all practical purposes. The enterprising and industrious editors of the St. Louis Republican, are entitled to much commendation for the labor which they have bestowed upon this subject; and if the publishers of newspapers throughout the country would follow their example, they would add greatly to their usefulness.

Number of Hogs Slaughtered in the West in 1843-4, 1844-5, *and* 1845-6.

OHIO.

Places.	1843-4.	1844-5.	1845-6.	*Places.*	1843-4.	1844-5.	1845-6.
Cincinnati,	240,000	196,000	300,000	Waynesville,	6,000	6,000	9,000
Columbus,	14,000	8,000	19,000	Hamilton,	40,000	32,000	30,000
Rariesport,	1,700	1,500	4,000	Camden,	8,000	7,000	9,000
Lancaster,	2,500	1,100	1,300	Eaton,	3,800	7,000	1,400
Circleville,	4,300	12,000	19,000	Clarksville,	11,000	10,000	6,200
Chilicothe,	52,000	24,000	40,000	Centreville,	700	600	1,200
Bainbridge,	3,000	550	1,200	Dayton,	20,000	12,000	8,000
Baltimore,	1,300	800	1,900	Troy,	4,000	1,000	2,000
Waverly,	2,800	1,300	4,000	New Paris,	5,000	10,000	7,000
Portsmouth,	2,000	900	1,500	Middletown,	10,000	7,500	8,500
Ripley,	——	10,000	15,200	Winchester,	1,200	800	1,000
Xenia,	5,000	1,500	1,200	Bellbrook,	1,400	1,400	3,000
Franklin,	3,000	2,800	2,900	Lebanon,	4,000	4,000	4,300
Piqua,	5,000	1,500	2,000	Greenville,	2,500	1,000	600

INDIANA.

Places.	1843-4.	1844-5.	1845-6.	*Places.*	1843-4.	1844-5.	1845-6.
Richmond,	5,400	800	1,100	Lagree,	3,000	——	1,000
Madison,	65,000	45,000	63,000	Fort Wayne,	3,000	800	2,000
Lafayette,	25,000	15,000	15,000	Covington,	5,000	4,000	6,000
Lawrenceb'g,	13,000	9,000	10,000	Eugene,	6,000	5,000	6,000
Connorsville,	——	1,000	7,000	Attica,	2,700	1,700	3,500
Evansville,	5,000	4,000	7,000	Dupin,	7,000	2,000	6,000
Laurel,	8,000	7,000	8,000	Terre Haute,	27,000	18,000	20,000
Brookville,	8,500	6,000	6,000				

ILLINOIS.

Alton,	37,000	16,000	23,000	Pekin,	20,000	10,000	——
Beardstown,	15,000	14,000	12,000	Quincy,	17.000	8,000	9,937
Griggsville,	3,000	2,500	3,500	Springfield,	16,000	3,000	3,400
Meredosia,	6,000	3,500	3,600	Whitehall,	8,000	1,000	1,200
Naples,	4,000	764	2,753	Winchester,	1,200	6,000	——
Peoria,	15,000	5,000	——				

MISSOURI.

St Louis,	——	16,000	30,498	Missouri river,	——	——	22,000
Upper Miss. riv.,	——	——	41,000				

KENTUCKY.

Louisville,	68,000	42,000	101,000	Bowling Green,	7,000	7,000	10,000
Westport,	11,000	14,000	17,000	Clarksville, Ten.	2,000	5,000	5,000
Maysville,	14,000	7,000	7,500				

No tables have been obtained for the year 1846-7, but the number is set down at 800,000.

Number of Hogs Slaughtered in 1847-8.

OHIO RIVER.

Wheeling,	5,000	Wabash & White rivers,	200,000
Cincinnati,	475,000	Scioto Valley,	100,000
Madison,	75,000	Aurora,	10,000
Louisville,	100,000	Covington,	6,000
Maysville,	10,000		
Tennessee & Cumberland rivers,	100,000	Total number,	1,081,000

MISSISSIPPI RIVER.

St. Louis,	63,924	Quincy,	20,000
Alton,	35,000	Keokuk,	10,000
Hannibal,	20,000	Oquawka,	5,000
Rockport,	3,000	Bloomington,	10,000
Lagrange and Tully,	5,000	Fort Madison,	10,000
Churchville,	5,000	Burlington,	15,000
Louisiana,	5,000		
Warsaw,	10,000	Total number,	216,924

ILLINOIS RIVER.

Peru,	3,000	Point Isabel,	5,000
Lacon,	5,000	Beardstown,	25,000
Peoria,	25,000	Meredosia,	10,000
Pekin,	25,000	Naples,	6,000

ILLINOIS RIVER—*Continued.*

LaGrange,	3,000	Griggsville,	6,000
Canton,	10,000	Tremont,	1,500
Knoxville,	10,000		
Springfield,	2,000	Total number,	156,500

MISSOURI RIVER.

St. Joseph,	5,000	Boonville,	4,000
Weston,	10,000	Rocheport,	3,000
Lexington,	2,000	Liberty,	2,000
Camden,	5,000		
Brunswick,	5,000	Total number,	39,000
Glasgow,	3,000		

Total amount of above tables, - - 1,492,924

There are several small towns not embraced in the above table, which will probably swell the total to 1,500,000.

From the foregoing, we gather the following results for the last five years: Total number for 1843–4, 912,000; 1844–5, 642,314; 1845–6, 955,588; 1846–7, 800,000; 1847–8, 1,492,924.

The following statement has been furnished us of the operations of the several slaughterers in this city during the past season:

Number of Hogs packed in St. Louis for the season 1847–8.

Mr. S. Finley,	9,000	Finney,	1,000
H. Ames,	9,300	Waddingham,	2,000
McAlisters,	5,000	Schipman,	1,272
Risley,	7,000	Craft,	1,050
Conn,	5,500	Schœnthaler,	800
Steitz,	5,112	Shaffer,	3,000
Bates,	3,000		
McFaul,	3,500	Total number,	63,924
Sigerson,	7,390		

From the foregoing statements, it will be seen that there has been an increase in the number of hogs slaughtered, amounting to 50 per cent. on the products of any previous year. In this city the slaughtering business has risen from 33,000 in 1846–7, to 63,000—about double—in 1847–8.

The following table furnishes a list of the number of hogs put up each year in Cincinnati, since 1833, inclusive, and the prices at which the market opened. The season begins in November and ends in March. Each year refers to that in which business closed:

Year.	*No. Hogs.*	*Price.*	*Year.*	*No. Hogs.*	*Price.*
1833	85,000		1841	160,000	$3.50a3.75
1834	123,000		1842	220,000	2.00a2.50
1835	163,000		1843	250,000	1.62a2.00
1836	123,000	$6.00a6.25	1844	240,000	2.25a2.65
1837	103,000	6.00a7.00	1845	213,000	2.50a2.70
1838	182,000	3.50a4.00	1846	287,000	4.00a4.25
1839	199,000	5.50a6.00	1847	250,000	2.70a2.80
1840	95,000	3.00a3.50			

Hogs packed in Ohio.

In 1844, 560,000; 1845, 450,000; 1846, 425,000; 1847, 325,000; of which aggregate, Cincinnati packed alone, in 1844, 43 per cent.; in 1845, 47 per cent.; in 1846, 68 per cent.; in 1847, 70 per cent.

The entire packing of the west may be divided as follows:

	1844.	1845.	1846.		1844.	1845.	1846.
Missouri,	16,000	31,700	70,898	Indiana,	257,414	147,420	250,236
Tenness.	16,000	1,500	42,975	Ohio,*	560,748	445,538	420,833
Kentucky	91,000	83,300	12,500	Union Pt.	1,200	8,830	18,675
Illinois,	136,709	67,964	68,120				

*Five minor points in this State not ascertained, and not included in this list, are supplied by estimates in tables, showing the number of hogs put up in each year.

Price of Pickled Pork in New York, from 1823 *to* 1847, *inclusive.*

Year.	Mess.	Pickled.	Year.	Mess.	Pickled.	Year.	Mess.	Pickled.
1823	$13 31	$9 78	1832	13 77	11 22	1840	15 07	12 96
1824	13 78	10 32	1833	14 97	11 53	1841	11 36	9 48
1825	13 83	10 22	1834	14 20	10 21	1842	9 27	7 23
1826	11 55	7 84	1835	17 96	13 09	1843	10 32	8 59
1827	13 21	8 62	1836	23 13	17 65	1844	9 28	7 39
1828	13 71	10 06	1837	21 66	15 99	1845	12 13	9 51
1829	13 79	10 24	1838	21 97	16 59	1846	10 50	8 78
1830	13 64	9 37	1839	19 32	15 72	1847	15 00	12 58
1831	14 30	11 13						

But a small quantity of what is packed is actually exported to foreign countries, as is seen by the following table:

Year.	Barrels.	Year.	Barrels.	Year.	Barrels.
1831	51,263	1837	24,510	1842	180,039
1832	88,025	1838	31,336	1843	80,310
1833	105,840	1839	41,301	1844	162,689
1834	82,691	1840	66,281	1845	161,609
1835	61,827	1841	182,399	1846	190,422
1836	22,540				

More than three-fourths of the exports are to the British Colonies, South America, and the West India Islands.

COMMERCIAL STATISTICS.

COMMERCE OF THE UNITED KINGDOM WITH THE UNITED STATES.

The following statement of the trade and commerce of the United Kingdom with the United States, is derived from Parliamentary returns to the British House of Commons in 1847. The commercial and fiscal year of Great Britain ends on the 5th of January.

EXPORTS TO THE UNITED STATES OF AMERICA.—An account of the declared value of the various articles of British produce and manufactures, exported to the United States of America for each of the past seven years, ending the 5th day of January, 1847.

Years.	Apparel Slops and Haberdashery.	Brass and Copper manufactures.	Cotton manufactures, includ'g Cotton Yarn.	Earthenware of all sorts.	H'rdw're & Cutlery.	Iron & Steel wro't and unwro't.
1840	£109,341	£107,473	£1,123,439	£179,933	£334,065	£355,534
1841	137,068	104,153	1,515,933	225,479	384,400	626,532
1842	84,893	89,952	487,276	168,873	298,881	304,854
1843	142,899	182,476	804,431	191,132	448,321	223,668
1844	229,871	197,289	1,052,908	348,928	827,084	696,937
1845	149,759	204,841	1,036,240	377,581	719,483	642,068
1846	176,143	209,203	1,133,657	343,155	739,793	737,199

Years.	Linen manufactures, including Linen Yarn.	Silk manufactures.	Tin & pewter wares; Tin, unwro't, and Tin Plates.	Woolen manufactures, including Yarn.	Other articles.
1840	£976,247	£274,159	£174,033	£1,077,828	£570,963
1841	1,232,247	306,757	223,809	1,549,926	592,318
1842	463,645	81,243	144,451	892,335	422,404
1843	715,546	164,233	171,890	1,564,470	453,643
1844	938,392	189,696	301,756	2,462,718	692,468
1845	911,318	218,377	350,333	1,805,181	712,462
1846	862,778	225,364	379,500	1,345,057	709,611

Aggregate value of British and Irish Produce and Manufactures, exported from the United Kingdom to the United States of America.

1840.	1841.	1842.	1843.	1844.	1845.	1846.
£5,283,020	7,098,642	3,528,807	5,013,514	7,938,079	7,147,663	6,830,460

IMPORTS FROM THE UNITED STATES OF AMERICA.—An account of the quantities of the various articles imported into the United Kingdom from the United States of America, with the quantities so imported entered for home consumption.

Years.	Bark for Tanners' or Dyers' use. Imported. Cwts.	Bark for Tanners' or Dyers' use. Home consumption. Cwts.	Beef, sa'ted. Imported. Cwts.	Beef, sa'ted. Home consumption. Cwts.	Cheese. Imported. Cwts.	Cheese. Home consumption. Cwts.
1840	37,776	30,073	77	17	—	—
1841	60,014	31,487	22,429	258	15,038	8,239
1842	27,648	21,353	7,024	2,898	14,907	13,913
1843	11,684	18,108	31,026	528	42,312	38,033
1844	20,990	29,579	76,660	487	53,114	55,414
1845	25,822	Free.	73,135	474	66,337	61,291
1846	23,473	Free.	161,668	Free.	91,901	82,046

Years.	Skins, Fox. Imporetd. No.	Skins, Fox. Home consumption. No.	Skins, Marten. Imported. No.	Skins, Marten. Home consumption. No.	Skins, Mink. Imported. No.	Skins, Mink. Home consumption. No.
1840	39,970	656	20,107	22,337	88,579	23,286
1841	71,335	1,366	40,998	32,698	109,257	52,218
1842	31,385	2,229	16,808	30,046	73,197	79,315
1843	61,670	2,048	25,144	20,384	94,773	66,695
1844	49,560	407	18,992	21,189	149,080	70,739
1845	46,964	Free.	39,340	Free.	205,276	Free.
1846	66,508	Free.	30,818	Free.	207,306	Free.

Years.	Corn, Wheat. Imported. Qrs.	Corn, Wheat. Home con. Qrs.	Corn, Wheat Flour. Imported. Cwts.	Corn, Wheat Flour. Home con. Cwts.	Hides, untanned. Imported. Cwts	Hides, untanned. Home con. Cwts.
1840	73,755	58,326	984,467	875,068	5,872	5,822
1841	10,553	27,087	359,745	311,490	1,699	1,705
1842	16,111	16,056	380,933	333,285	7,248	6,173
1843	—	—	91,317	16 521	11,578	10,739
1844	2,421	2,421	292,011	29,122	26,781	27,150
1845	23,239	595	246,341	6,071	28,109	Free.
1846	171,155	142,034	2,229,550	2,132,244	26,793	Free.

Years.	Skins, Musquash. Imported.	Home con.	Skins, Raccoon. Imported.	Home con.	Skins, Seal. Imported.	Home con.
	No.	*No.*	*No.*	*No.*	*No.*	*No.*
1840	138,398	228,613	492,539	467	2,041	13,211
1841	191,944	127,819	567,785	1,976	8,178	8,178
1842	300,976	358,003	175,525	40,218	24,112	2,848
1843	288,036	106,619	375,993	60,510	66,287	34,399
1844	223,232	165,704	362,349	9,366	—	450
1845	1,070,566	Free.	546,630	Free.	32,380	Free.
1846	7,132	Free.	639,746	Free.	12,108	Free.

Years.	Iron, Chromate of. Imported.	Home con.	Lard. Imported.	Home con.	Oil, Spermaceti. Imported.	Home con.
	Tons.	*Tons.*	*Cwts.*	*Cwts.*	*Tons.*	*Tons.*
1840	5·7	593	—	—	1,408	350
1841	295	650	4,729	3,044	801	1,166
1842	911	1,046	26,555	24,977	1,171	294
1843	808	808	76,010	60,641	1,866	1,642
1844	2,060	2,060	69,138	81,445	1,052	1,468
1845	1,750	Free.	44,358	Free.	3,783	2,792
1846	1,071	Free.	85,666	Free.	2,207	2,975

Years.	Tallow. Imported.	Home con.	Tar. Imported.	Home con.	Tobacco, unmanufactured. Imported.	Home con.
	Cwts.	*Cwts.*	*Lasts.*	*Lasts.*	*Lbs.*	*Lbs.*
1840	3,870	4,766	1,243	1,275	34,626,886	22,169,551
1841	1,208	1,208	2,273	2,344	42,133,969	21,260,407
1842	28,040	26,884	1,560	1,563	36,694,236	21,223,159
1843	46,503	43,950	1,600	1,733	41,038,597	21,894,764
1844	52,799	54,567	873	893	36,615,985	23,298,563
1845	52,056	47,686	1,239	Free.	31,151,472	24,700,881
1846	60,546	67,182	1,556	Free.	48,612,355	25,237,008

Years.	Pork, Salted. Imported.	Home con.	Rice, not in husk. Imported.	Home con.	Rice,* rough and in husk. Imported.	Home con.
	Cwts.	*Cwts.*	*Cwts.*	*Cwts.*	*Qrs.*	*Qrs.*
1840	7	2	343	230	41,528	17,605
1841	10,076	259	145	53	40,313	32,377
1842	13,406	6,523	2,686	444	40,377	38,898
1843	9,882	1,556	13,874	4,065	18,596	14,076
1844	24,342	1,032	5,149	828	36,603	27,156
1845	21,774	1,138	4,553	413	43,178	23,920
1846	45,453	Free.	40,340	27,736	29,789	25,192

*Exclusive of quantities cleaned in the United Kingdom, and exported on drawback.

Years.	Tobacco. Manf. or Segars. Imported.	Home con.	Turpentine. Imported.	Home con.	Wax, Bees'. Imported.	Home con.
	Lbs.	*Lbs.*	*Cwt.*	*Cwt.*	*Cwt.*	*Cwt.*
1840	1,163,833	7,771	349,136	382,014	331	326
1841	1,435,898	7,137	361,622	338,916	459	472
1842	281,172	7,034	408,330	453,428	1,094	920
1843	624,192	6,330	473,183	473,577	2,362	1,669
1844	615,950	3,685	452,195	466,550	1,664	1,654
1845	1,719,956	5,424	507,655	Free.	1,294	Free.
1846	1,409,059	5,254	355,766	Free.	1,326	Free.

Years.	Seeds, Clover. Imported.	Home con.	Seeds, Linseed and Flaxseed. Imported.	Home con.	Skins, Bear. Imported.	Home con.
	Cwts.	*Cwts.*	*Qrs.*	*Qrs.*	*No.*	*No.*
1840	—	2	9,164	9,010	4,693	552
1841	13,293	6,164	3,693	3,860	6,379	344
1842	22,632	24,177	2,448	2,593	5,126	90
1843	8,976	6,216	3,670	3,670	5 377	494
1844	7,796	11,599	2,876	2,864	5,128	303
1845	29,265	20,755	10,381	Free.	4,128	Free.
1846	26,469	31,491	7,536	Free.	5,573	Free.

Years.	Wood and Timber, not sawn or split. Imported.	Home con.	Wood and Timber, Staves. Imported.		Home consumption.	
	Loads.	*Loads.*	*Gt. hund.*	*Loads.*	*Gt.hund.*	*Loads.*
1840	2,282	2,282	677	....	....	....
1841	2,905	2,514	705	....	....	....
1842	1,032	690	747	231	17	20
1843	6,574	4,025	....	810	....	116
1844	1,059	3,955	....	208	....	180
1845	1,979	2,335	Free.	7,982	Free.	Free.
1846	20,452	11,760	Free.	15,275	Free.	Free.

Years.	Skins, Beaver. Imported. *No.*	Home consumption. *No.*	Skins, Deer. Imported. *No.*	Home consump. *No.*
1840	12,180	12,104	409,208	90,149
1841	15,250	14,971	126,970	82,406
1842	12,881	9,751	155,176	39,177
1843	8,913	10,333	161,014	55,945
1844	5,601	6,355	107,643	30,893
1845	4,471	Free.	171,843	Free.
1846	577	Free.	152,988	Free.

Years.	Wool, Cotton. Imported. *Lbs.*	Home consumption. *Lbs.*	Wool, Sheep and Lambs'. Imported. *Lbs.*	Home consumption. *Lbs.*
1840	487,856,504	452,990,122	115,095	235,967
1841	358,240,964	353,353,309	58,791	42,500
1842	414,030,779	386,107,190	561,028	287,626
1843	574,626,510	509,475,209	126,615	212,577
1844	517,218,622	454,967,749	29,355	Free.
1845	626,650,412	Free.	835,448	Free.
1846	401,953,804	Free.	901,024	Free.

The following extract from a speech recently made by Mr. NILES, in the Senate of the United States, is credited by the St. Louis Republican to the Richmond Whig.

We commend it to the attentive consideration of our readers, and more especially to the provision and grain growers of the west.

The opinion has generally been entertained in this country that the British Corn Laws were the only obstacle to the consumption of American breadstuffs in Great Britain; and it was pretty generally believed that when the poorer classes of that country learned to cook and eat Indian corn, the people of the west would find a market for all they could grow. Let us observe how this matter stands after the experience of two years.

The recent famine caused a suspension of the Corn Laws, and necessity compelled the poorer classes to use Indian corn to a very considerable extent; and for a time this article appeared to be in great favor, there being a less difference between the price of corn and wheat in Great Britain than in this country. But as soon as a favorable crop is gathered, neither the suspension of the Corn Laws nor the acquired fondness for Indian corn can induce the people of Great Britain to purchase more of our breadstuffs than formerly; and we find the quantity of corn exported to Great Britain, which was 6,931,640 bushels for the six months ending on the 4th of March, 1847, reduced to 1,337,204 bushels for the six months ending on the 4th of March, 1848, and even a large part of this was shipped before the effects of the famine had passed away. These facts ought to convince the American people of the folly of looking abroad for a market for their grain.

Statement of the exports of Breadstuffs from this country to Great Britain, from September 1, 1847, to March 4, 1848.

From—	FLOUR. Barrels.	MEAL. Barrels.	WHEAT. Bushels.	CORN. Bushels.
New York,	137,082	30,913	177,934	751,170
New Orleans to Feb. 26,	13,554	20,656	33,195	322,830
Philadelphia,	1,435	19,639	——	76,049
Baltimore,	770	1,796	4,000	88,478
Boston,	504	3,100	——	77,494
Other ports to February 26,	——	——	——	21,184
Total,	153,445	76,104	215,139	1,337,204
The exports for the same period a year ago were	1,258,876	248,859	1,273,882	6,931,640
Decrease,	1,105,431	173,748	1,068,743	5,594,436

"I have computed the value of these exports for each period in New York, assuming for last year's prices $8 50 for flour, $2 25 for wheat, $5 50 for meal and $1 12½ for corn, and for the last period the prices ruling at the present time. The total value of the exports for the first period exceeds $22,000,000, and those of the last period a little more than $2,000, and showing a difference of over $20,000,000. The freights for the first period exceeds three millions of dollars, and for the last are less than two hundred thousand; so that the loss on freights, had it all gone to American citizens, exceeds the whole amount of exports and freights for the last six months. The facts in this statement were taken from the Commercial Shipping List, and are presumed to be substantially correct."

MANUFACTURE OF BELLOWS' IN ST. LOUIS.

We were much pleased a few days since with a visit to the Bellows Factory of J. B. M'Kown, on Tenth Street, between Locust and Olive streets. The enterprize and industry of the proprietor of this establishment, commend him to the consideration and patronage of the citizens of the west, generally. Commencing what was at that time a new branch of business in St. Louis, he met with but little encouragement in the beginning. But by firmness and perseverance he has succeeded not only in building up a manufacturing establishment which yields him a handsome revenue, but by its superior quality and cheapness, his article has driven the eastern bellows from the market, and he can, in fact, manufacture the article cheaper here than can the eastern manufacturer. This is an additional fact in support of our oft-repeated proposition, that the Valley of the Mississippi contains all the elements necessary for manufacturing purposes; and at no distant day must become the great manufacturing district of the United States—while St. Louis must become the great central mart of concentration and distribution; and let none be surprised if in a few years hence the rail roads,

canals, &c., which the east with such eagerness and energy is extending through the heart of the west for the purpose of drawing to themselves the raw material to be manufactured at their own establishments, should carry back to the shores of the Atlantic manufactured fabrics from the work shops of the west, for the eastern and European markets. All of this and more will come to pass. Let him, therefore, who would not be behind the march of events, look and observe, and shape his business to meet this *inevitable* destiny of the west, arising from imperious and uncontrollable circumstances.

This establishment manufactures about six hundred pair of bellows per annum, of very superior quality, both in material and workmanship, consisting of the common blacksmith bellows, a very superior article of furnace bellows used in the different mining regions of the west in smelting; also a cylinder bellows which is used for the same purpose.

This establishment uses about 1,200 sides of leather per annum, at a cost of about $3,000, about 50,000 feet of lumber, about 7,000 pounds of iron, 400 pounds of glue, $100 worth of paint, $200 in hinges, screws, tacks, &c.

MINES AND MINING.

MISSOURI COPPER.

We were highly gratified yesterday to see, at the store of Messrs. Poindexter & Wilson, corner of Main and Market streets, a sample of copper from the mines in Franklin county, in this State. The lot consisted of about 700 weight of pig metal, pure and free from foreign particles. This copper, we learned, was produced by Mr. Philips, who has no experience in the process of smelting copper ore, and knows but little of its properties or characteristics Induced by curiosity, he took a quantity of ore, which he says they call the green carbonate, and in a common blacksmith's hearth, with the ordinary bellows of a blacksmith's shop, he produced the above stated amount of pure metal. He says that, weighing the ore and the pig metal, he ascertained, that the ore yielded rising of *thirty per cent.* The purity of the metal may be estimated from the fact, that it was sold in this market at from sixteen to eighteen cents per pound, and promptly taken. An experiment was made yesterday, at the extensive Foundry of Messrs. Burd, Rucker & Co., by casting a portion of it into a bell, which is said to be the proper test of its purity. The result of the experiment we have not yet ascertained, but the melting and process of casting was highly satisfactory to the workmen.

The mine from which this ore was taken is known as Hurst's Mine, is about sixty miles from this city, in Franklin county, and in the vicinity of several large deposits of similar ores. There are, in that vicinity and in all the country round about, indications of rich deposits of this mineral. It is in the centre of an ex-

cellent agricultural country, capable of subsisting any amount of labor, and within a convenient distance to this market, with a natural road that requires but little expenditure to render it available the year round. The seasons here are such that the mines may be worked the whole year, and the requisite timber, &c., are abundant.

In these copper mines, the State of Missouri has a greater amount of wealth than has yet been discovered in the famous copper mines on Lake Superior, or in the numerous lead discoveries of this and other Western States. Gentlemen of science and information, who have visited and critically examined the mines, say, that the amount of ore is without limit, and that all the tests which have been made show, that it is of a very rich kind. The only drawback thus far has been the want of a proper mode of smelting the ore. That it is practicable, by the application of proper means, this experiment proves beyond a doubt; and that the ore is extraordinarily rich, is shown by the fact, that by a very imperfect manner of smelting, it has been made to yield *thirty* per cent.

A great drawback to the development of these mines is to be found in the fact, that a large portion of the lands in that vicinity are yet held by the Government, and whenever an important discovery is made, the discoverers endeavor to conceal their information, lest some one else should come in and purchase some other lands desired by them. We have regretted this selfish spirit, because it serves to prevent the introduction of capital into the country, and of course prevents any extension of mining operations.—*St. Louis Republican.*

IRON: A SHORT SKETCH OF ITS PRODUCTION.

BY DR. L. FEUCHTWANGER.

To the Editor of the Merchants' Magazine, &c.

This metal occupies at the present day a more important rank than any other metal. While we can exist without the use of the precious metals, iron is as indispensable to the comforts of man, as nourishment is to the support of life. With the increase of the population, and civilization of the inhabitants of the world, the consumption and application of iron must increase in proportion; so also its uses will be more accessible, according to the advancement of science and improved knowledge of simplifying the process of its easy and economical extraction from the ore. Already the quantity of iron which is annually consumed in the United States, goes beyond conception. The quantity of pig iron produced in the United States, in 1810, was 53,908 tons; while, in 1847, the quantity of pig iron made here exceeds 500,000 tons. The latest improvements, by the hot blast and other contrivances, have increased the product of pig metal fifty per cent., so that we may reasonably expect the product of pig iron to be about 700,000 tons, which, at the average price of $35 per ton of No. 1 pig iron, would be a revenue to

the States where it is produced of $24,500,000, the principal part of which goes to the States of Pennsylvania, New York, and Tennessee. The State of Missouri, with its inexhaustible deposits of superior iron, has not until lately, produced any pig iron, although the city of St. Louis, containing twelve of the largest foundries in the western country, for the construction of machinery, steamboats, &c., has been obliged to import its pig iron from great distances on the Ohio, Tennessee, and Cumberland Rivers. The Iron Mountain, which is supposed capable of furnishing 600,000,000 tons, is beginning to supply, in a small measure, the demand; but the cost of transportation from the interior, nearly fifty miles, enhances its expense. Within a few months, however, a company of some enterprising St. Louis merchants have opened an immense deposit of rich iron ore, contiguous to the Mississippi River, which bids fair to supply the demands for pig iron in St. Louis, and the Missouri and Upper Mississippi Valleys. I allude to the St. Louis and Birmingham Iron Company, a distance of two miles from the town of Birmingham, and 120 miles below St. Louis. The iron ore which I have seen, and of which I possess specimens, is, I should judge, sixty per cent., and is easy to flux. The coal-beds on the opposite shore, in Illinois, yield the most inexhaustible supply of superior bituminous coal. Charcoal, as well as stone coal, can be had at the furnace for about three cents per bushel; and there is no reason why the company should not produce 100 tons of pig iron per week, by each furnace, and why they cannot erect four furnaces, so as to produce 400 tons of pig iron, worth in St. Louis $40 per ton.

The location of the town of Birmingham offers, perhaps, the most encouraging inducements for the establishment of a United States armory, which will sooner or later be required by the government in the western country, for the manufacture of ammunition and other war implements. The Mississippi River offers there the best channel for the landing of steamboats, at all seasons; and the St. Louis and Birmingham Iron Company will, I trust, be capable of furnishing all the varieties of iron required in the western country, such as bar, bloom, and rail road iron.

We have received from Frederick Woolford, Esq., of Caledonia, Missouri, quite an extensive collection of specimens of clay, kaolin and ores; also, specimens of several varieties of ware, manufactured at his establishment. Among the latter are some very fair specimens of queensware. We have not as yet had time to analyze and class the specimens of ores, &c., but hope that we shall be able to give an account of them in our next number. The specimens may be seen at the office of Dr. H. A. Prout, on Pine street in this city.

TO AGENTS.

Such individuals as have been requested to act as agents, will please to let us hear from them at an early day.

OUR EXCHANGE LIST.

THE CULTIVATOR.

The first four numbers of the 5th volume, new series, of this periodical has been received. The merits of this work has been long established throughout the country, and we should be pleased to see it more generally patronized in the west. We think that every farmer who reads the Cultivator will feel satisfied at the end of the year that he has got the full value of its price.

HUNT'S MERCHANTS' MAGAZINE.

We are indebted to the able and industrious Editor of this highly valuable periodical for the April number. It contains much interesting matter and comes fully up to the standard of the work. By the way, we beg to make one suggestion to the Editor: we have examined his rail road statistics, in some six or eight numbers, with a view of ascertaining the charges for the transportation of freight on the different roads, but have met with no tables which give this information. These are facts that would be highly interesting to the people of the west.

SOUTHERN LITERARY MESSENGER.

The April number of this highly interesting work has been received. It contains several articles of more than ordinary merit, which fully sustain the high character of the work.

THE WESTERN LANCET.

The first four numbers of the seventh volume of the Western Lancet is before us, and although not exactly in our line, we are, nevertheless, under obligations to the publishers, and shall be pleased to continue the exchange. The preservation of health is a subject of the highest interest to every individual, and comes properly within the range of political economy. Inquiries into the causes which produce disease in different parts of the country, might be made the means of preventing much suffering—and we should at all times be pleased to do any thing in our power to promote such investigations.

AMERICAN PHRENOLOGICAL JOURNAL.

The April number of this long established work has been received.

THE AMERICAN ARTIZAN.

We have been in regular receipt of this valuable paper for some time, and take pleasure in recommending it to the patronage of our readers, especially to the mechanics of the west.

CLUBS

Will be furnished with six copies of the WESTERN JOURNAL for fifteen dollars, for the term of one year.